

S Poplar River
628.16 Cooperative
M26prcn Monitoring
1982 Agreement ... data
4th qtr. exchange, Canadian
contribution

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**POPLAR RIVER
COOPERATIVE MONITORING
ARRANGEMENT**

1982

FOURTH QUARTER DATA EXCHANGE

CANADIAN CONTRIBUTION

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INTRODUCTION

1982 - FOURTH QUARTER DATA EXCHANGE POPLAR RIVER BASIN

On September 23, 1980, the Governments of Canada and the United States agreed to a Cooperative Monitoring Arrangement to formalize the ongoing quarterly exchange of respective data from water quantity, water quality and air quality monitoring programs conducted near the International Boundary. The monitoring programs are in response to the construction of Saskatchewan Power Corporation's coal-fired thermal generating station near Coronach, Saskatchewan, and the concerns expressed for transboundary impacts. A binational committee called the Poplar River Bilateral Monitoring Committee was established to carry out the responsibilities under the arrangement and to prepare an annual report to government.

One of the responsibilities of the Committee is to facilitate the quarterly exchange of data which supersedes the regular exchange of information relating to the Poplar River Project which was agreed to by the Governments of Canada, the United States, Montana and Saskatchewan on July 12, 1976. The Poplar River Bilateral Monitoring Committee met on March 12-13, 1981, and identified the data to be exchanged and the mechanisms. The Committee agreed that the first exchange of information under the Cooperative Monitoring Arrangement would be for the period January 1, 1981 to March 31, 1981 and on a regular quarterly basis thereafter. The Committee met in March 1982 to review the data for the calendar year 1981. The report of the Committee was drafted and submitted to government before the end of March 1982.

The Saskatchewan Power Corporation's 300 Megawatt Poplar River power station at Coronach was officially commissioned on June 20, 1981. The second unit of the power station was originally scheduled to be commissioned in November 1982. Because of a summer long construction strike, commissioning has been delayed until early 1983.

This package includes water quality, water quantity and air quality information from Canadian sources for the Poplar River basin for the fourth quarter of 1982. The pages have been numbered consecutively in the corners for ease of reference. Pages have been included from the Technical Monitoring Schedule. These pages also retain their original page numbering.

POPLAR RIVER

**COOPERATIVE MONITORING
ARRANGEMENT**

TECHNICAL MONITORING SCHEDULE

CANADA

STREAMFLOW MONITORING DATA

STREAMFLOW MONITORING

Responsible Agency: Environment Canada

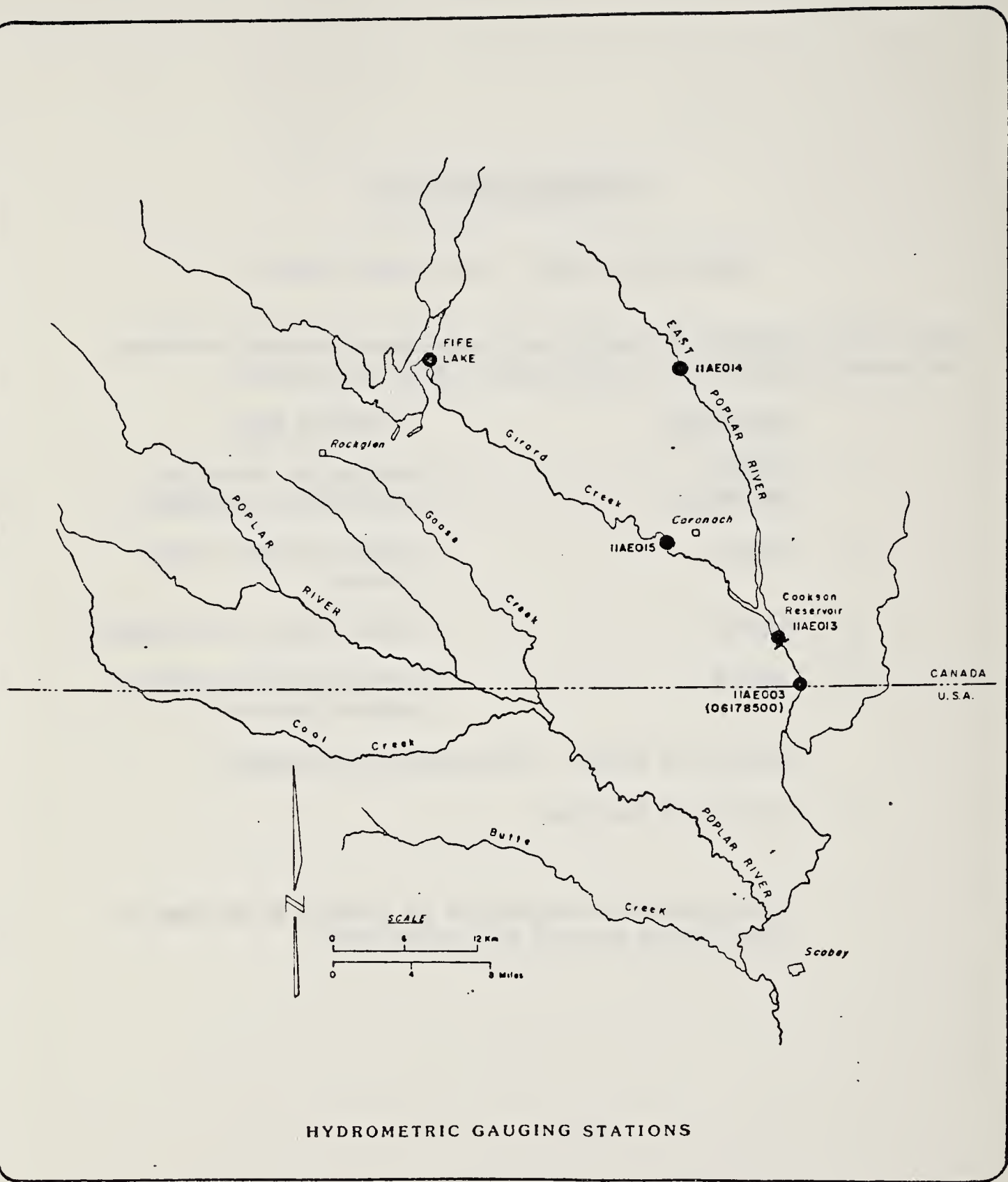
Daily mean discharge or levels and instantaneous monthly extremes as normally published in surface water data publications.

<u>Station No.</u>	<u>Station Name</u>
1. 11AE003 (06178500)	East Poplar River at International Boundary
2. 11AE013	Cookson Reservoir near Coronach
3. 11AE015	Girard Creek near Coronach
4. 11AE014	East Poplar River above Cookson Reservoir

Responsible Agency: Saskatchewan Environment

5. * Fife Lake Overflow

* - Miscellaneous measurements of outflow to be made by SDOE during periods of outflow only.



(PRELIMINARY) DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	0.054 B	0.025 B	0.025 B	1.84	0.878	1.42	0.133	0.085	0.079	0.091	0.091	0.088	1
2	0.051 B	0.025 B	0.025 B	1.78	1.08	1.39	0.139	0.093	0.079	0.096	0.091	0.088	2
3	0.051 B	0.025 B	0.025 B	1.93	1.30	1.27	0.150	0.099	0.079	0.091	0.085	0.088	3
4	0.051 B	0.025 B	0.025 B	1.98	1.61	1.22	0.144	0.091	0.093	0.093	0.085	0.091	4
5	0.051 B	0.025 B	0.025 B	1.93	1.50	1.10	0.130	0.085	0.085	0.093	0.088	0.088	5
6	0.051 B	0.025 B	0.025 B	1.87	1.78	1.30	0.258	0.082	0.082	0.091	0.088	0.088	6
7	0.051 B	0.025 B	0.025 B	1.70	1.25	0.963	0.181	0.085	0.079	0.091	0.091	0.085	7
8	0.051 B	0.025 B	0.025 B	1.53	1.10	0.736	0.122	0.093	0.076	0.093	0.091	0.085	8
9	0.051 B	0.025 B	0.025 B	1.42	1.05	0.680	0.113	0.082	0.076	0.099	0.091	0.085	9
10	0.048 B	0.025 B	0.025 B	1.36	1.16	0.538	0.108	0.076	0.079	0.093	0.091	0.085	10
11	0.048 B	0.025 B	0.028 B	1.70	0.906	0.453	0.105	0.076	0.079	0.088	0.091	0.085	11
12	0.048 B	0.025 B	0.028 B	3.28	0.821	0.368	0.096	0.079	0.079	0.088	0.082	0.085	12
13	0.048 B	0.025 B	0.028 B	4.30	0.793	0.340	0.093	0.076	0.079	0.085	0.082	0.085	13
14	0.045 B	0.025 B	0.028 B	18.2	0.765	0.453	0.088	0.076	0.079	0.091	0.082	0.085	14
15	0.028 B	0.025 B	0.028 B	83.0	0.793	0.566	0.110	0.076	0.079	0.085	0.085	0.085	15
16	0.023 B	0.028 B	0.028 B	58.9	0.821	0.623	0.193	0.079	0.082	0.088	0.088	0.085	16
17	0.023 B	0.028 B	0.028 B	16.5	0.850	0.481	0.241	0.079	0.079	0.088	0.091	0.088	17
18	0.023 B	0.028 B	0.028 B	3.48	0.765	0.368	0.150	0.079	0.079	0.091	0.091	0.091	18
19	0.023 B	0.028 B	0.028 B	18.2	0.765	0.368	0.122	0.079	0.079	0.091	0.091	0.091	19
20	0.023 B	0.028 B	0.028 B	13.5	0.878	0.266	0.108	0.079	0.079	0.088	0.085	0.088	20
21	0.023 B	0.028 B	0.028 B	2.27	0.793	0.227	0.096	0.079	0.076	0.088	0.082	0.088	21
22	0.023 B	0.028 B	0.028 B	2.21	0.708	0.201	0.093	0.082	0.079	0.088	0.082	0.088	22
23	0.023 B	0.028 B	0.028 B	2.38	0.765	0.368	0.093	0.079	0.079	0.091	0.079	0.088	23
24	0.023 B	0.025 B	0.142 B	2.80	0.736	0.212	0.091	0.079	0.079	0.091	0.079	0.085	24
25	0.023 B	0.025 B	0.566 B	2.89	0.566	0.144	0.088	0.079	0.079	0.091	0.079	0.085	25
26	0.025 B	0.025 B	0.850 B	2.83	0.538	0.127	0.093	0.082	0.079	0.091	0.082	0.085	26
27	0.025 B	0.025 B	0.991 B	2.78	0.651	0.170	0.113	0.079	0.088	0.096	0.085	0.082	27
28	0.025 B	0.025 B	0.991 B	2.07	1.13	0.283	0.102	0.082	0.105	0.096	0.088	0.079	28
29	0.025 B	0.025 B	1.13 B	0.850	0.963	0.190	0.105	0.079	0.099	0.093	0.088	0.082	29
30	0.025 B	0.025 B	1.70 B	0.793	1.47	0.150	0.093	0.076	0.091	0.085	0.088	0.085	30
31	0.025 B	0.025 B	1.84 B		1.44		0.091	0.079	0.091	0.088	0.085	0.085	31
TOTAL	1.107	0.724	8.824	260.273	30.625	16.975	3.842	2.524	2.454	2.812	2.592	2.671	TOTAL
MEAN	0.036	0.026	0.285	8.68	0.988	0.566	0.124	0.081	0.082	0.091	0.086	0.086	MEAN
DAM3	95.6	62.6	762	22500	2650	1470	332	218	212	243	224	231	DAM3
MAX	0.054	0.028	1.84	83.0	1.78	1.42	0.258	0.099	0.105	0.099	0.091	0.091	MAX
MIN	0.023	0.025	0.025	0.793	0.538	0.127	0.088	0.076	0.076	0.085	0.079	0.079	MIN

SUMMARY FOR THE YEAR 1982

MEAN DISCHARGE, 0.919 M3/S

TOTAL DISCHARGE, 29000 DAM3

MAXIMUM DAILY DISCHARGE, 83.0 M3/S ON APR 15

MINIMUM DAILY DISCHARGE, 0.023 M3/S ON JAN 16

MAXIMUM INSTANTANEOUS DISCHARGE 89.2 M3/S AT 1300 CST ON APRIL 15

B-ICE CONDITIONS

(PRELIMINARY) DAILY WATER LEVEL IN METRES FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	751.867	751.916	751.969	751.850	753.106	753.157	752.989	752.946	752.750	752.613	752.620	752.618	1
2	751.872	751.915	751.969	751.847	753.127	753.160	752.990	752.936	752.744	752.619	752.619	752.622	2
3	751.872	751.916	751.975	751.832	753.140	753.154	752.991	752.929	752.741	752.621	752.615	752.626	3
4	751.874	751.916	751.971	751.807	753.137	753.149	752.991	752.923	752.736	752.617	752.614	752.628	4
5	751.876	751.920	751.971	751.786	753.130	753.141	752.985	752.923	752.729	752.618	752.614	752.629	5
6	751.879	751.921	751.971	751.760	753.118	753.126	752.973	752.920	752.725	752.618	752.616	752.626	6
7	751.880	751.919	751.971	751.736	753.112	753.107	752.973	752.911	752.722	752.621	752.616	752.622	7
8	751.879	751.918	751.968	751.711	753.106	753.099	752.968	752.902	752.721	752.622	752.617	752.622	8
9	751.878	751.923	751.973	751.684	753.099	753.091	752.967	752.893	752.719	752.626	752.614	752.629	9
10	751.878	751.926	751.975	751.663	753.096	753.086	752.968	752.882	752.708	752.624	752.615	752.627	10
11	751.880	751.931	751.975	751.650	753.089	753.083	752.969	752.879	752.697	752.624	752.611	752.630	11
12	751.881	751.937	751.975	751.703	753.086	753.078	752.970	752.872	752.690	752.626	752.606	752.637	12
13	751.882	751.935	751.973	751.872	753.085	753.075	752.967	752.865	752.678	752.627	752.607	752.640	13
14	751.893	751.941	751.974	752.542	753.084	753.067	752.960	752.865	752.668	752.632	752.609	752.647	14
15	751.892	751.939	751.976	753.026	753.082	753.071	752.955	752.854	752.661	752.630	752.609	752.648	15
16	751.900	751.944	751.980	752.851	753.083	753.067	752.962	752.849	752.660	752.631	752.611	752.650	16
17	751.909	751.944	751.982	752.858	753.087	753.057	752.967	752.848	752.659	752.633	752.613	752.656	17
18	751.913	751.944	751.982	753.027	753.082	753.049	752.968	752.846	752.658	752.626	752.615	752.658	18
19	751.915	751.948	751.981	753.050	753.078	753.042	752.970	752.838	752.650	752.621	752.611	752.659	19
20	751.916	751.950	751.980	752.949	753.085	753.038	752.968	752.832	752.648	752.623	752.604	752.662	20
21	751.917	751.952	751.980	752.945	753.085	753.035	752.962	752.822	752.645	752.625	752.606	752.666	21
22	751.919	751.954	751.981	752.986	753.082	753.029	752.962	752.810	752.641	752.625	752.607	752.666	22
23	751.920	751.956	751.978	753.045	753.079	753.010	752.958	752.799	752.636	752.629	752.607	752.667	23
24	751.924	751.966	751.972	753.079	753.071	752.999	752.956	752.794	752.630	752.633	752.611	752.664	24
25	751.928	751.967	751.955	753.091	753.070	752.990	752.951	752.787	752.626	752.634	752.609	752.665	25
26	751.928	751.968	751.928	753.090	753.069	752.991	752.950	752.781	752.621	752.636	752.607	752.668	26
27	751.918	751.966	751.910	753.079	753.061	752.989	752.956	752.774	752.617	752.635	752.613	752.662	27
28	751.916	751.970	751.894	753.072	753.069	753.000	752.954	752.769	752.621	752.630	752.615	752.666	28
29	751.914		751.877 A	753.078	753.094	752.992	752.951	752.766	752.613	752.623	752.618	752.672	29
30	751.911		751.866 E	753.092	753.130	752.989	752.947	752.756	752.612	752.620	752.619	752.678	30
31	751.914		751.857 A		753.146		752.948	752.756		752.621		752.681	31
TOTAL	23308.845	21054.302	23310.689	22573.761	23345.968	22591.921	23341.946	23338.327	22580.226	23331.383	22578.368	23332.091	TOTAL
MEAN	751.898	751.939	751.958	752.459	753.096	753.064	752.966	752.849	752.674	752.625	752.612	752.648	MEAN
MAX	751.928	751.970	751.982	753.092	753.146	753.160	752.991	752.946	752.750	752.636	752.620	752.681	MAX
MIN	751.867	751.915	751.857	751.650	753.061	752.989	752.947	752.756	752.612	752.613	752.604	752.618	MIN

SUMMARY FOR THE YEAR 1982

MAXIMUM DAILY WATER LEVEL, 753.160 METRES ON JUN 2

MINIMUM DAILY WATER LEVEL, 751.650 METRES ON APR 11
MAXIMUM INSTANTANEOUS WATER LEVEL, 753.168 METRES AT 1554 CST ON June 2
WATER LEVELS ARE REFERRED TO GEODETIC SURVEY OF CANADA DATUM

A-MANUAL GAUGE

E-ESTIMATED

(PRELIMINARY) DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1			0.081 B	0.260 B	0.192	0.642			0.082 E	0.182	0.122 A		1
2			0.144 B	0.182 B	0.157	0.403			0.081 E	0.191			2
3			0.251 B	0.120 B	0.115	0.281			0.080 E	0.178			3
4			0.136 B	0.083 B	0.155	0.195			0.079 E	0.166			4
5			0.131 B	0.075 B	0.119	0.131			0.078 E	0.156			5
6			0.300 B	0.071 B	0.099	0.080			0.078 E	0.161			6
7			0.350 B	0.071 B	0.092	0.073			0.077 A	0.133			7
8			0.310 B	0.072 B	0.092	0.076			0.081	0.146			8
9			0.289 B	0.074 B	0.092	0.090			0.079	0.146			9
10			0.187 B	0.117 B	0.108	0.088 E			0.075	0.132			10
11			0.104 B	0.566 B	0.103	0.086 E			0.073	0.146			11
12			0.091 B	4.83 B	0.095	0.083 E			0.069	0.138			12
13			0.082 B	33.3 B	0.094	0.081 E			0.071	0.130			13
14			0.082 B	42.4 B	0.084	0.080 E			0.070	0.155			14
15			0.083 B	26.1	0.087	0.080 E			0.071	0.158			15
16			0.082 B	13.2	0.090	0.082 E			0.070	0.162			16
17			0.080 B	6.61	0.089	0.083 E			0.069	0.159			17
18			0.079 B	4.28	0.087	0.086 E			0.070	0.154			18
19			0.127 B	1.95	0.091	0.092 E			0.070	0.155			19
20			0.080 B	1.23	0.135	0.103 E			0.071	0.136			20
21		0.089 B	0.073 B	1.07	0.129	0.107 A			0.070	0.133			21
22		0.092 B	0.070 B	1.07	0.108	0.109 E			0.069	0.143			22
23		0.091 B	0.068 B	1.17	0.126	0.110 E			0.068	0.135			23
24		0.091 B	0.054 B	0.856	0.141	0.112 E			0.079	0.145			24
25		0.091 B	0.049 B	0.687	0.151	0.118 E			0.103	0.144			25
26	0.080 B	0.049 B	0.049 B	0.544	0.127	0.120 E			0.141	0.130			26
27	0.083 B	0.055 B	0.055 B	0.441	0.115	0.150 E			0.149	0.111			27
28	0.089 B	0.065 B	0.065 B	0.338	0.232	0.610 E	0.085 A		0.164	0.114			28
29		0.138 B	0.138 B	0.295	1.30	0.540 E			0.157	0.109			29
30		0.274 B	0.274 B	0.208	1.52	0.250 E		0.083 A	0.152	0.107			30
31		0.263 B	0.263 B		1.04			0.082 E		0.107			31
TOTAL			4.227	142.270	7.165	5.141			2.646	4.462			TOTAL
MEAN			0.136	4.74	0.231	0.171			0.088	0.144			MEAN
DAM3			365	12300	619	444			229	386			DAM3
MAX			0.350	42.4	1.52	0.642			0.164	0.191			MAX
MIN			0.049	0.071	0.084	0.073			0.068	0.107			MIN

A-MANUAL GAUGE
B-ICE CONDITIONS
E-ESTIMATED

MAXIMUM INSTANTANEOUS DISCHARGE, 49.0 M3/S AT 0105 c.s.t. ON April 14

(PRELIMINARY) DAILY DISCHARGE IN CUBIC METRES PER SECOND FOR 1982

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1			0 B	0	B	1.94	0.207	0.086	0.005	0	0		1
2			0 B	0	B	1.40	0.113	0.048	0.003	0	0		2
3			0 B	0	B	0.831	0.214	0.016	0.002	0	0		3
4			0 B	0	B	0.545	0.095	0.008	0.001	0	0		4
5			0 B	0	B	0.318	0.024	0.005	0.001	0	0		5
6			0 B	0	B	0.340	0.011	0.003	0	0	0		6
7			0 B	0	B	0.268	0.006	0.002	0	0	0		7
8			0 B	0	B	0.138	0.005	0.002	0	0	0		8
9			0 B	0	B	0.077	0.003	0.001	0	0	0		9
10			0 B	0	B	0.187	0.002	0.001	0	0	0		10
11			0 B	0.038 B	0.197	0.002	0	0	0	0	0		11
12			0 B	0.155 B	0.138	0.001	0	0	0	0	0		12
13			0 B	10.7 B	0.099	0.001	0	0	0	0	0		13
14			0 B	30.0	0.070	0.001	0	0	0	0	0		14
15			0 B	23.6	0.053	0.001	0	0	0	0	0		15
16			0 B	11.8	0.068	0.001	0.001	0	0	0	0		16
17			0 B	7.58	0.072	0	0.001	0	0	0	0		17
18			0 B	6.97	0.066	0	0.001	0	0	0	0		18
19			0 B	2.49	0.066	0	0.001	0	0	0	0		19
20			0 B	1.41	0.202	0	0	0	0	0	0		20
21			0 B	2.29	0.316	0	0	0	0	0	0		21
22	0 B		0 B	3.20	0.184	0	0	0	0	0	0		22
23	0 B		0 B	2.95	0.119	0	0	0	0	0	0		23
24	0 B		0 B	2.13	0.082	0	0	0	0	0	0		24
25	0 B		0 B	1.44	0.049	0	0	0	0	0	0		25
26	0 B		0 B	1.13	0.027	0	0.001	0	0	0	0		26
27	0 B		0 B	1.06	0.015	0.001	0.071	0	0	0	0		27
28	0 B		0 B	1.17	0.261	0.553	0.086	0	0	0	0		28
29			0 B	1.55	3.32	0.546	0.053	0	0	0	0		29
30			0 B	1.82	0.942	0.218	0.018	0	0	0	0		30
31			0 B		0.406		0.007	0		0	0		31
TOTAL			0	113.483	12.796	2.005	0.412	0.012	0	0	0		TOTAL
MEAN			0	3.78	0.413	0.067	0.013	0	0	0	0		MEAN
DAM3			0	9800	1110	173	35.6	1.04	0	0	0		DAM3
MAX			0	30.0	3.32	0.553	0.086	0.005	0	0	0		MAX
MIN			0	0	0.015	0	0	0	0	0	0		MIN

SUMMARY FOR THE MONTHS MAR TO OCT
MEAN DISCHARGE, 0.525 M3/S
TOTAL DISCHARGE, 11100 DAM3
MAXIMUM DAILY DISCHARGE, 30.0 M3/S ON APR 14
MINIMUM DAILY DISCHARGE, 0 M3/S ON MAR 1
MAXIMUM INSTANTANEOUS DISCHARGE, 42.7 M3/S AT 2254 CST ON April 14

B-ICE CONDITIONS

SURFACE WATER QUALITY DATA

SURFACE WATER QUALITY MONITORING

Sampling Locations

Responsible Agency: Saskatchewan Environment

<u>No. on Map</u>	<u>Station No.</u>	<u>Station Name</u>
1	01SK02000002	Fife Lake Overflow
2	00SK02000006	Girard Creek South of Town of Cornach
3	05SK02000002	Upper End of Cookson Reservoir at Highway 36
4	05SK02000004	Cookson Reservoir near Dam
5	00SK02000002	Cookson Reservoir discharge at concrete pad

Responsible Agency: Environment Canada

6	00SA11AE0008	East Poplar River at International Boundary
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Parameters

Responsible Agency: Saskatchewan Environment

<u>ESQUADAT* Code</u>	<u>Parameter</u>	<u>Analytical Method</u>	<u>Sampling Frequency Station No: 1 2 3 4 5</u>
10151	Alkalinity-pheno	Pot. Titration	OF Q Q Q Q
10109	Alkalinity-tot	Pot. Titration	OF Q Q Q Q
13004	Aluminum Total	AA-direct	A A A A
33006	Arsenic-tot	AA	A A A A
06201	Bicarbonates	Calculated	OF Q Q Q Q
05105	Boron-diss	Colourimetric	W Q Q Q Q
48000	Cadmium-tot	AA-Aqua-Regia	A A A A
20100	Calcium	Calculated	OF Q Q Q Q
06053	Carbon-tot Inorg	IR	OF Q Q Q Q
06008	Carbon-tot Org	Calculated	OF Q Q Q Q
06301	Carbonates	Calculated	OF Q Q Q Q
17204	Chloride	Titration	OF Q Q Q Q
06708	Chlorophyll a	Spectrometric	Q Q Q Q
24004	Chromium-tot	AA-graphite	A A A A
36011	Coliform-fec	MPN	OF Q Q Q Q
36001	Coliform-tot	MPN	OF Q Q Q Q
02041	Conductivity	Wheatstone bridge	W Q Q Q Q
29004	Copper-tot	AA-graphite	A A A A
09103	Fluoride	Colourimetric	A A A A
82004	Lead-tot	AA-graphite	A A A A
12101	Magnesium	Calculated	OF Q Q Q Q
80011	Mercury-tot	Flameless AA	A A A A
42005	Molybdenum	AA-HNO ₃	A A A A
07016	N-TKN	Colourimetric	OF Q Q Q Q
10406	NFR	Gravimetric	OF Q Q Q Q
10505	NFR(F)	Gravimetric	OF Q Q Q Q
28007	Nickel-total	AA-graphite	OF Q Q Q Q
07109	Nitrate + NO ₂	Colourimetric	OF Q Q Q Q
06521	Oil and Grease		A A A A
0810YZ	Oxygen-diss	Meter	OF Q Q Q Q
15409	Phosphorus-tot	Colourimetric	OF Q Q Q Q
19102	Potassium	AA	OF Q Q Q Q
34301	Selenium-Ext	AA	A A A A
11102	Sodium	AA	OF Q Q Q Q
16308	Sulphate	Colourimetric	OF Q Q Q Q
00206	TDS	Calculated	OF Q Q Q Q
0206YZ	Temperature		OF Q Q Q Q
23001	Vanadium-tot	AA-HNO ₃	A A A A
30008	Zinc-tot	AA-graphite	A A A A
10301	pH	Electrometric	W Q Q Q Q

*Computer storage and retrieval system - Saskatchewan Environment
 Symbols: W - Weekly during overflow; OF - once during each period of overflow greater than 2 weeks' duration; Q-quarterly;
 A-annually in the fall; AA-atomic absorption; IR-infrared;
 Pot-potentiometric; NFR-nonfiltrable residue
 NFRF-nonfiltrable residue, fixed

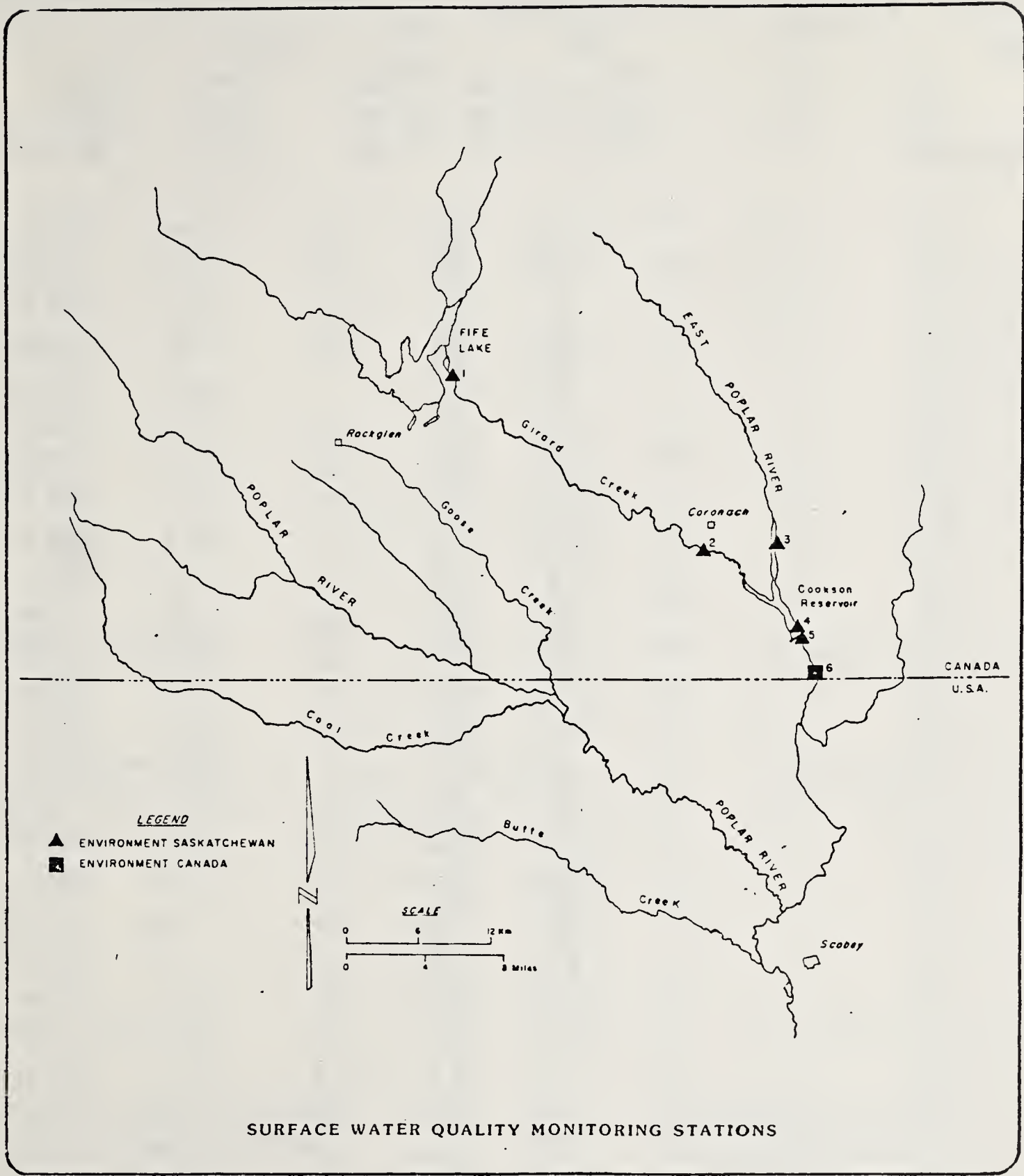
PARAMETERS (Continued)

Responsible Agency: Environment Canada

NAQUADAT* Code	Parameter	Analytical Method	Sampling Frequency Station No: 6
10151	Alkalinity-pheno	Potentiometric	M
10101	Alkalinity-tot	Potentiometric	M
1330Z	Aluminum-Ext	AA	M
07569	Ammonia-Free	Calculated	M
07506	Ammonia-total	Electrometric	M
33104	Arsenic-diss	Flameless AA	M
56020	Barium-tot	AA	M
06201	Bicarbonates	Calculated	M
05105	Boron-diss	Carminic Acid	M
48020	Cadmium-tot	AA Acid H ₂ O ₂	M
20103	Calcium	AA-Direct	M
06401	Carbon Dioxide	Calculated	M
06902	Carbon-partic	Elemental Analyzer	M
06002	Carbon-tot Org	UV Digestion	M
06301	Carbonates	Calculated	M
17206	Chloride	Colourimetric	M
06711	Chlorophyll a	Spectrophotometric	M
24302	Chromium-Ext	AA-direct	M
27020	Cobalt-tot	AA Acid H ₂ O ₂	M
36012	Coliform-fec	MF	M
36002	Coliform-tot	MF	M
02011	Colour	Comparator	M
02041	Conductivity	Wheatstone Bridge	M
29020	Copper-tot	AA-Acid H ₂ O ₂	M
06604	Cyanide	UV-Colourimetric	M
09105	Fluoride	Electrometric	M
10602	Hardness	Calculated	M
08501	Hydroxide	Calculated	M
26104	Iron-diss	AA-direct	M
82020	Lead-tot	AA-Acid H ₂ O ₂	M
12102	Magnesium	AA-direct	M
25104	Manganese-diss	AA-direct	M
80011	Mercury-tot	Flameless AA	M
07902	N-particulate	Elemental Analyzer	M
07651	N-tot diss	UV Colourimetric	M
10401	NFR	Gravimetric	M
28020	Nickel-total	AA-Acid H ₂ O ₂	M
07110	Nitrate	Colourimetric	M
07603	Nitrogen-tot	Calculated	M
180XX	Organo Chlorines	GC	M
08101	Oxygen-diss	Whinkler	M
15901	P-particulate	Calculated	M
15103	P-tot diss	Colourimetric	M
06535	Phenolics	Colourimetric	M
185XX	Phenoxy Herbicides	GC	M
15406	Phosphorus-tot	Colourimetric	M
19103	Potassium	Flame Emission	M
18601	Pyridine Herbicides	GC	M
11201	SAR	Calculated	M
00210	Sat Index	Calculated	M
34102	Selenium-diss	Flameless AA	M
14105	Silica	Colourimetric	M
11103	Sodium	Flame Emission	M
00211	Stab Index	Calculated	M
16306	Sulphate	Colourimetric	M
00202	TDS	Calculated	M
02061	Temperature	Alcohol	M
02073	Turbidity	Nephelometric	M
23020	Vanadium-tot	AA-Acid H ₂ O ₂	M
30020	Zinc-tot	AA-Acid H ₂ O ₂	M
10301	pH	Electrometric	M

*Computer storage and retrieval system - Environment Canada

Symbols: M-Monthly; AA-atomic absorption; MF-membrane filtration;
UV-ultraviolet; NFR-nonfiltrable residue; GC-gas chromatography



Surface Water Quality

Quarterly Sampling

LOCATION: Girard Cr. S. of Town of Coronach

DATE	1981			1982	
	4th	1st	2nd	3rd	4th
	DEC.	FEB.	MAY	AUG.	NOV.
PARAMETERS	SPC	SPC	SPC	SPC	SPC
B mg/L	1.72	1.62	1.17	1.49	1.58
TDS mg/L	939	950	715	795	890
FSS mg/L	0	0.4	21.2	13.6	33.4
HCO ₃ mg/L	580	664	522	454	572
CO ₃ mg/L	27	<0.5		29.0	<0.5
Cl mg/L	7.2	6.2	6.1	5.9	6.5
SO ₄ mg/L	294	256	222	210	266
Ca mg/L	23.5	77.7	59.0	15.1	63.0
Mg mg/L	48.6	49.2	41.3	44.8	51.0
K mg/L	8.4	7.5	8.4	7.0	7.7
Na mg/L	239	223	166	202	199
Conductivity US/CM	1417	1423	1120	1328	1400
Fe mg/L	0.26	0.10	0.10	0.06	0.45
Mn mg/L	0.07	0.03	0.16	<0.01	<0.01
total hardness mg/L	259	397.0	317.5	222.0	367.5
NO ₃ as N mg/L	0.275	0.500	0.010	<0.003	0.655
TKN mg/L	1.17	1.08	1.10	0.60	0.72
TP mg/L	0.038	0.19*	0.10*	0.04*	0.03*
TIC mg/L	153	45*	76*	129*	Z*
TOC mg/L	8.7	99*	<1*	6*	Z*
pH mg/L	8.75	8.17	7.90	8.81	7.96
temperature (°C)	-0.5	0.0	8.0	23.0	1.8
D.O. mg/L		4.2	10.8	10.4	11.9
Total Coliforms orgs/100 ml	15	<100*	<100*	30*	<100*
Fecal Coliforms orgs/100 ml	2	<10*	<10*	20*	<10*
Chlorophyll mg/L	0.011	0.012*	<0.001*	0.006*	<0.001*
TSS mg/L	3.2	2.4	29.2	22.8	39.4
Phenol Alk. mg/L	22.4	<0.5	<0.5	24.2	<0.5
Total Alk. mg/L	520	545	428	421	469

* SDOE data

Z machine malfunction

Surface Water Quality

Quarterly Sampling

LOCATION: Upper end of Cookson Res. at Highway #36

PARAMETERS	1981			1982	
	4th	1st	2nd	3rd	4th
	NOV.	FEB.	MAY	JULY	NOV.
	SPC	SPC	SPC	SPC	SPC
B mg/L	1.20	1.5	0.61	0.55	0.75
TDS mg/L	740	850	350	410	470
FSS mg/L	0.8	0	12.4	19*	7.4
HCO ₃ mg/L	474	529	267	307	329
CO ₃ mg/L	14.5	24.0		19	6.0
Cl mg/L	6.5	7.8	3.7	10	4.1
SO ₄ mg/L	204	240	109	124	124
Ca mg/L	34.9	40.5	23.9	35*	30.6
Mg mg/L	38.1	45.9	21.9	32*	29
K mg/L	15.5	19.0	9.9	12*	11.1
Na mg/L	156	202	80	85*	97
Conductivity US/CM	1120	1288	563	603	732
Fe mg/L	0.15	0.05	0.81	0.35	0.28
Mn mg/L	0.04	0.03	0.04	0.07	0.01
total hardness mg/L	244	290.0	150	220*	196
NO ₃ as N mg/L	0.240	0.610	0.280	<0.03	0.138
TKN mg/L	1.72	1.35	1.11	2.30	1.02
TP mg/L	0.07	0.13*	0.12*	0.19*	0.05*
TIC mg/L	92	105*	43*	66*	Z*
TOC mg/L	14.2	57*	5*	3*	Z*
pH mg/L	8.53	8.73	7.68	7.48	8.48
temperature (°C)	0.5	1.0	10.0	19.5	4.5
D.O. mg/L	6.0	4.2	9.8	8.0	10.3
Total Coliforms orgs/100 ml	12	<100*	<100*	<100*	<100*
Fecal Coliforms orgs/100 ml	L1	<10*	<10*	<10*	<10*
Chlorophyll mg/L	0.002	<0.001*	<0.001*	0.034*	<0.001*
TSS mg/L	2.4	1.6	20.4	26*	10.2
Phenol Alk. mg/L	12.0	20.0	<0.5		4.8
Total Alk. mg/L	413	474	219		274

* SDOE data

Z machine malfunction

Surface Water Quality

Quarterly Sampling

LOCATION: Cookson Reservoir near dam

PARAMETERS	1981			1982	
	4th	1st	2nd	3rd	4th
	NOV.	FEB.	MAY	AUG.	NOV.
	SPC	SPC	SPC	SPC	SPC
B mg/L	1.25	1.47	0.72	0.66	0.77
TDS mg/L	740	850	400	455	475
FSS mg/L	2.4	28.8	24.8	3.6	9.2
HCO ₃ mg/L	474	516	300	300	326
CO ₃ mg/L	12.5	23.0	0.0	0	10.0
Cl mg/L	6.8	7.5	4.7	3.7	4.2
SO ₄ mg/L	198	236	124	108	124
Ca mg/L	32.4	41.1	25.2	24.9	30.2
Mg mg/L	39.3	45.2	24.6	26.2	29.0
K mg/L	17.2	18.8	10.0	10.2	11.2
Na mg/L	171	203	96	82	97
Conductivity US/CM	1110	1255	631	738	728
Fe mg/L	0.15	0.55	0.70	0.31	0.32
Mn mg/L	0.02	0.04	0.02	<0.01	<0.01
total hardness mg/L	243	289.0	164.0	170.0	195.0
NO ₃ as N mg/L	0.24	0.64	0.115	0.01	0.116
TKN mg/L	1.55	1.30	1.10	0.94	1.28
TP mg/L	0.060	0.10*	0.13*	0.08*	0.06*
TIC mg/L	92	91*	43*	62*	Z*
TOC mg/L	14.3	19*	5*	4*	Z*
pH mg/L	8.46	8.73	7.72	8.26	8.52
temperature (°C)	0.0	0.2	9.5	23.0	7.5
D.O. mg/L	6.24	4.63	10.20	6.4	9.9
Total Coliforms orgs/100 ml	1	<100*	<100*	<100*	<100*
Fecal Coliforms orgs/100 ml	L1	<10*	<10*	<10*	<10*
Chlorophyll mg/L	0.006	<0.001*	0.012*	0.006*	<0.001*
TSS mg/L	4.0	34.4	33.6	11.2	12.8
Phenol Alk. mg/L	10.4	19.2	<0.5	<0.5	8.0
Total Alk. mg/L	410	462	246	246	275

* SDOE data

Z machine malfunction

Surface Water Quality

Quarterly Sampling

LOCATION: Cookson Res. discharge at concrete pad

DATE	1981			1982	
	4th	1st	2nd	3rd	4th
	NOV.	FEB.	MAY	AUG.	NOV.
PARAMETERS	SPC	SPC	SPC	SPC	SPC
B mg/L	1.73	1.85	0.73	1.55	1.60
TDS mg/L	1050	1000	420	850	895
FSS mg/L	3.2	2.0	15.6	19.6	9.6
HCO ₃ mg/L	627	634	310	544	588
CO ₃ mg/L		<0.5	0	0	<0.5
Cl mg/L	7.0	6.7	4.2	5.9	6.1
SO ₄ mg/L	356	318	130	232	275
Ca mg/L	93	92.7	27.1	47.4	86.0
Mg mg/L	62.9	60.0	25.6	54.6	53.0
K mg/L	8.6	8.8	9.5	8.8	8.4
Na mg/L	188	192	98	157	160
Conductivity US/CM	1550	1498	650	1410	1320
Fe mg/L	0.93	0.82	0.90	1.01	1.14
Mn mg/L	0.24	0.12	0.01	0.19	0.08
total hardness mg/L	491	478.5	173.0	343	433
NO ₃ as N mg/L	0.139	0.177	0.151	0.615	1.00
TKN mg/L	1.19	1.18	1.19	1.00	1.04
TP mg/L	0.077	0.05*	0.12*	0.04*	0.04*
TIC mg/L	127	120*	48*	120*	Z*
TOC mg/L	7.0	24*	2*	12*	Z*
pH mg/L	7.93	8.22	7.68	8.21	7.91
temperature (°C)	2.6	1.0	9.5	15.0	1.5
D.O. mg/L	7.0	4.2	10.5	7.4	11.1
Total Coliforms orgs/100 ml	L1	100*	200*	130*	<100*
Fecal Coliforms orgs/100 ml	L1	<10*	<10*	40*	<10*
Chlorophyll mg/L	0.001	<0.001*	0.016*	0.006*	<0.001*
TSS mg/L	6.0	4.8	21.6	30.8	13.6
Phenol Alk. mg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total Alk. mg/L	514	520	254	446	482

* SDOE data

Z machine malfunction

WATER QUALITY BRANCH
WESTERN REGION
ENVIRONMENT CANADA

SAMPLE 038201983

STATION 00SA11AE0008 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

DATE SAMPLED OCT 21, 1982 1150 HOURS CST

SUBMITTER ID 0003

RESULT CODES	NV - NO VALUE	IN - INTERFERENCE
	* - CALCULATED VALUE	IS - INSUFFICIENT SAMPLE
	SD - SAMPLE DESTROYED	‡ - UNUSUAL VALUE
	L - LAB FILTERED	F - FIELD FILTERED

ALL VALUES IN MG/L EXCEPT OTHERWISE NOTED

*** SITE RESULTS ***

DISSOLVED OXYGEN 12.4

*** FIELD LAB RESULT ***

SPEC CONDUCTANCE (uS/cm)	1366.	TEMPERATURE (Deg C)	4.0
PH (pH Units)	7.9	TURBIDITY (JTU)	6.2

*** PHYSICAL DATA ***

TURBIDITY (JTU)	3.8	TEMPERATURE (Deg C)	16.7
COLOUR (Rel Units)	20.	PH (pH Units)	8.1
RESIDUE N.F. (105 C)	5.		

*** NUTRIENTS ***

PHOSPHORUS (Total as P)	0.020	PHOSPHORUS (Total Soluble)	0.008
NITROGEN (Total as N) *	0.45	NITROGEN (Diss as N) L	0.45
NITROGEN (Diss NO3+NO2 as N) F	0.09	NITROGEN (Tot Ammonia as N)	0.3
CARBON (Diss Org as C) L	6.7	PHOSPHORUS (Particulate) *	0.012
CARBON (Part Org as C) L	0.48	NITROGEN (Part as N) L	10.01
NITROGEN (Diss as N) F	0.46		

*** BIOLOGICAL DATA

TOTAL COLIFORM (No./100 mL)	L2.	FECAL COLIFORM (No./100 mL)	L2.
CHLOROPHYLL A	0.004		

*** ORGANIC DATA ***

PHENOLIC MATERIAL (ug/L) 0.002

*** BALANCE DATA AND CALCULATED PARAMETERS ***

SPEC CONDUCTANCE (uS/cm)	1330.	ALKALINITY (Phenol as CaCO3)	0.0
ALKALINITY (Total as CaCO3)	530.	HARDNESS (Total AS CaCO3) *	337.0
STAB INDEX/RYZNAR-pH UNITS *	3.9	CALCIUM (Diss)	52.5
MAGNESIUM (Diss)	50.	SODIUM (Diss)	230.
POTASSIUM (Diss)	8.3	CHLORIDE (Diss)	6.3
FLUORIDE (Diss)	0.28	SULPHATE (Diss)	296.
SILICA REACTIVE	13.	HYDROXIDE *	0.0
CARBONATE *	0.0	BICARBONATE *	646.1
TOTAL DISSOLVED SOLIDS *	974.8	SAT INDX/LANGELIER-pH UNITS *	2.1
FREE CO2 *	8.1	PERCENT SODIUM *	59.0
NON CARBONATE HARDNESS *	0.0		

STATION 009A11AE0008 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

DATE SAMPLED OCT 21, 1982 1150 HOURS CST

SUBMITTER ID 0003

RESULT CODES NV - NO VALUE IN - INTERFERENCE
 * - CALCULATED VALUE IS - INSUFFICIENT SAMPLE
 SD - SAMPLE DESTROYED † - UNUSUAL VALUE
 L - LAB FILTERED F - FIELD FILTERED

ALL VALUES IN MG/L EXCEPT OTHERWISE NOTED

*** HEAVY METALS, TRACE ELEMENTS, AND TOXIC MATERIALS ***

ALUMINUM	(Extbl)	0.04	ARSENIC	(Diss)	0.0013
BARIUM	(Total)	0.07	BORON	(Diss)	1.8
CADMIUM	(Total)	LO.001	COBALT	(Total)	LO.002
COPPER	(Total)	0.002	CYANIDE	(Total)	0.002
IRON	(Diss)	LO.04	LEAD	(Total)	LO.004
MANGANESE	(Diss)	0.12	MERCURY	(Total) (ug/L)	LO.02
NICKEL	(Total)	LO.002	SELENIUM	(Diss)	0.0005
VANADIUM	(Total)	LO.001	ZINC	(Total)	0.001

*** SYNTHETIC ORGANIC COMPOUNDS *** (RESULTS IN UG/L)

2,4,5-T	LO.002	2,4-D	0.01
2,4-DB	LO.009	2,4-DP	LO.004
ALDRIN	LO.001	AROCOR 1242	LO.002
AROCOR 1254	LO.002	AROCOR 1260	LO.005
AROCOR TOTAL	LO.002	ALPHA-BHC	0.003
ALPHA-CHLORDANE	LO.003	GAMMA-CHLORDANE	LO.002
P,P'-DDD	LO.002	P,P'-DDE	LO.001
P,P'-DDT	LO.004	O,P'-DDT	LO.001
DIELDRIN	LO.002	ALPHA-ENDOSULFAN	LO.001
BETA-ENDOSULFAN	LO.003	ENDRIN	LO.002
HEPTACHLOR	LO.001	HEPTACHLOR EPOXIDE	LO.002
LINDANE	LO.001	MCPA	LO.2
METHOXYCHLOR	LO.01	PICLORAM	LO.2
SILVEX	LO.004	MIREX	LO.001
HCB	LO.001		

WATER QUALITY BRANCH
WESTERN REGION
ENVIRONMENT CANADA

SAMPLE 038202249

STATION 00SA11AE0008 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

DATE SAMPLED DEC 01, 1982 1600 HOURS CST

SUBMITTER ID 0003

RESULT CODES	NV - NO VALUE	IN - INTERFERENCE
	* - CALCULATED VALUE	IS - INSUFFICIENT SAMPLE
	SD - SAMPLE DESTROYED	# - UNUSUAL VALUE
	L - LAB FILTERED	F - FIELD FILTERED

ALL VALUES IN MG/L EXCEPT OTHERWISE NOTED

*** SITE RESULTS ***

DISSOLVED OXYGEN 7.9

*** FIELD LAB RESULT ***

SPEC CONDUCTANCE (uS/cm)	1397.	TEMPERATURE (Deg C)	1.0
PH (pH Units)	8.0	TURBIDITY (JTU)	4.6

*** PHYSICAL DATA ***

TURBIDITY (JTU)	3.4	TEMPERATURE (Deg C)	20.7
COLOUR (Rel Units)	20.	PH (pH Units)	7.5
RESIDUE N.F. (105 C)	2.		

*** NUTRIENTS ***

PHOSPHORUS (Total as P)	0.013	PHOSPHORUS (Total Soluble)	0.011
NITROGEN (Total as N) *	0.70	NITROGEN (Diss as N) L	0.70
NITROGEN (Diss NO3+NO2 as N) F	0.10	NITROGEN (Tot Ammonia as N)	0.6
CARBON (Diss Org as C) L	4.6	PHOSPHORUS (Particulate) *	10.0
CARBON (Part Org as C) L	0.22	NITROGEN (Part as N) L	10.01
NITROGEN (Diss as N) F	0.74		

*** BIOLOGICAL DATA

TOTAL COLIFORM (No./100 mL)	L2.	FECAL COLIFORM (No./100 mL)	L2.
CHLOROPHYLL A	0.004		

*** ORGANIC DATA ***

PHENOLIC MATERIAL (ug/L) 10.001

*** BALANCE DATA AND CALCULATED PARAMETERS ***

SPEC CONDUCTANCE (uS/cm)	1360.	ALKALINITY (Phenol as CaCO3)	0.0
ALKALINITY (Total as CaCO3)	540.	HARDNESS (Total AS CaCO3) *	303.
STAB INDEX;RYZNAR-PH UNITS *	4.5	CALCIUM (Diss)	37.5
MAGNESIUM (Diss)	51.	SODIUM (Diss)	221.
POTASSIUM (Diss)	7.5	CHLORIDE (Diss)	6.1
FLUORIDE (Diss)	0.40	SULPHATE (Diss)	298.
SILICA REACTIVE	16.	HYDROXIDE *	0.0
CARBONATE *	0.0	BICARBONATE *	658.3
TOTAL DISSOLVED SOLIDS *	961.9	SAT INDX;LANGELIER-PH UNITS *	1.5
FREE CO2 *	33.0	PERCENT SODIUM *	60.6
NON CARBONATE HARDNESS *	0.0		

DATE SAMPLED DEC 01, 1982 1600 HOURS CST

SUBMITTER ID 0003

RESULT CODES NV - NO VALUE IN - INTERFERENCE
 * - CALCULATED VALUE IS - INSUFFICIENT SAMPLE
 SD - SAMPLE DESTROYED ‡ - UNUSUAL VALUE
 L - LAB FILTERED F - FIELD FILTERED

ALL VALUES IN MG/L EXCEPT OTHERWISE NOTED

*** HEAVY METALS, TRACE ELEMENTS, AND TOXIC MATERIALS ***

ALUMINUM (Extbl)	L0.06	ARSENIC (Diss)	0.0016
BARIUM (Total)	L0.05	BORON (Diss)	1.9
CADMIUM (Total)	L0.001	COBALT (Total)	L0.002
COPPER (Total)	0.002	CYANIDE (Total)	0.001
IRON (Diss)	L0.04	LEAD (Total)	L0.004
MANGANESE (Diss)	0.19	MERCURY (Total) (ug/L)	0.07
NICKEL (Total)	L0.002	SELENIUM (Diss)	L.0005
VANADIUM (Total)	L0.001	ZINC (Total)	0.001

*** SYNTHETIC ORGANIC COMPOUNDS *** (RESULTS IN UG/L)

2,4,5-T	L0.002	2,4-D	L0.004
2,4-DB	L0.009	2,4-DP	L0.004
ALDRIN	L0.001	AROCLOR 1242	L0.002
AROCLOR 1254	L0.002	AROCLOR 1260	L0.005
AROCLOR TOTAL	L0.002	ALPHA-BHC	L0.001
ALPHA-CHLORDANE	L0.003	GAMMA-CHLORDANE	L0.002
P,P'-DDD	L0.002	P,P'-DDE	L0.001
P,P'-DDT	L0.004	O,P'-DDT	L0.001
DIELDRIN	L0.002	ALPHA-ENDOSULFAN	L0.001
BETA-ENDOSULFAN	L0.003	ENDRIN	L0.002
HEPTACHLOR	L0.001	HEPTACHLOR EPOXIDE	L0.002
LINDANE	L0.001	MCPA	L0.2
METHOXYCHLOR	L0.01	PICLORAM	NV
SILVEX	L0.004	MIREX	L0.001
HCB	L0.001		

WATER QUALITY BRANCH
WESTERN REGION
ENVIRONMENT CANADA

SAMPLE 038202359

STATION 00SA11AE0008 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

DATE SAMPLED DEC 15, 1982 1120 HOURS CST
SUBMITTER ID 0003

RESULT CODES	NV - NO VALUE	IN - INTERFERENCE
	* - CALCULATED VALUE	IS - INSUFFICIENT SAMPLE
	SD - SAMPLE DESTROYED	# - UNUSUAL VALUE
	L - LAB FILTERED	F - FIELD FILTERED

ALL VALUES IN MG/L EXCEPT OTHERWISE NOTED

*** SITE RESULTS ***

DISSOLVED OXYGEN 12.6

*** FIELD LAB RESULT ***

SPEC CONDUCTANCE (uS/cm)	1349.	TEMPERATURE (Deg C)	0.0
PH (pH Units)	7.9	TURBIDITY (JTU)	4.5

*** PHYSICAL DATA ***

TURBIDITY (JTU)	3.5	TEMPERATURE (Deg C)	11.7
COLOUR (Rel Units)	20.	PH (pH Units)	7.4
RESIDUE N.F. (105 C)	2.		

*** NUTRIENTS ***

PHOSPHORUS (Total as P)	0.013	PHOSPHORUS (Total Soluble)	0.004
NITROGEN (Total as N) *	0.73	NITROGEN (Diss as N) L	0.73
NITROGEN (Diss NO3+NO2 as N) F	0.15	NITROGEN (Tot Ammonia as N)	0.8
CARBON (Diss Org as C) L	5.2	PHOSPHORUS (Particulate) *	0.009
CARBON (Part Org as C) L	0.28	NITROGEN (Part as N) L	0.01
NITROGEN (Diss as N) F	0.78		

*** BIOLOGICAL DATA

TOTAL COLIFORM (No./100 mL)	NV	FECAL COLIFORM (No./100 mL)	NV
CHLOROPHYLL A	0.006		

*** ORGANIC DATA ***

PHENOLIC MATERIAL (ug/L) 0.001

*** BALANCE DATA AND CALCULATED PARAMETERS ***

SPEC CONDUCTANCE (uS/cm)	1340.	ALKALINITY (Phenol as CaCO3)	0.0
ALKALINITY (Total as CaCO3)	535.	HARDNESS (Total AS CaCO3) *	305.8
STAB INDEX; RYZNAR-PH UNITS *	4.6	CALCIUM (Diss)	41.0
MAGNESIUM (Diss)	49.4	SODIUM (Diss)	205.
POTASSIUM (Diss)	7.6	CHLORIDE (Diss)	5.7
FLUORIDE (Diss)	0.26	SULPHATE (Diss)	278.
SILICA REACTIVE	16.	HYDROXIDE *	0.0
CARBONATE *	0.0	BICARBONATE *	652.2
TOTAL DISSOLVED SOLIDS *	924.6	SAT INDX; LANGELEIR-PH UNITS *	1.4
FREE CO2 *	41.2	PERCENT SODIUM *	58.6
NON CARBONATE HARDNESS *	0.0		

STATION 00SA11AE0008 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

DATE SAMPLED DEC 15, 1982 1120 HOURS CST

SUBMITTER ID 0003

RESULT CODES NV - NO VALUE IN - INTERFERENCE
 * - CALCULATED VALUE IS - INSUFFICIENT SAMPLE
 SD - SAMPLE DESTROYED ‡ - UNUSUAL VALUE
 L - LAB FILTERED F - FIELD FILTERED

ALL VALUES IN MG/L EXCEPT OTHERWISE NOTED

*** HEAVY METALS, TRACE ELEMENTS, AND TOXIC MATERIALS ***

ALUMINUM (Extbl)	0.05	ARSENIC (Diss)	0.0013
BARIUM (Total)	0.05	BORON (Diss)	1.7
CADMIUM (Total)	L0.001	COBALT (Total)	L0.002
COPPER (Total)	L0.001	CYANIDE (Total)	0.003
IRON (Diss)	L0.04	LEAD (Total)	L0.004
MANGANESE (Diss)	0.24	MERCURY (Total) (ug/L)	0.03
NICKEL (Total)	0.003	SELENIUM (Diss)	L.0005
VANADIUM (Total)	L0.001	ZINC (Total)	L0.001

*** SYNTHETIC ORGANIC COMPOUNDS *** (RESULTS IN UG/L)

2,4,5-T	L0.002	2,4-D	L0.004
2,4-DB	L0.009	2,4-DP	L0.004
ALDRIN	L0.001	AROCLOR 1242	L0.002
AROCLOR 1254	L0.002	AROCLOR 1260	L0.005
AROCLOR TOTAL	L0.002	ALPHA-BHC	L0.001
ALPHA-CHLORDANE	L0.003	GAMMA-CHLORDANE	L0.002
P,P'-DDD	L0.002	P,P'-DDE	L0.001
P,P'-DDT	L0.004	O,P'-DDT	L0.001
DIELDRIN	L0.002	ALPHA-ENDOSULFAN	L0.001
BETA-ENDOSULFAN	L0.003	ENDRIN	L0.002
HEPTACHLOR	L0.001	HEPTACHLOR EPOXIDE	L0.002
LINDANE	L0.001	MCPA	L0.2
METHOXYCHLOR	L0.01	PICLORAM	L0.2
SILVEX	L0.004	MIREX	L0.001
HCB	L0.001		

GROUNDWATER QUALITY DATA

GROUNDWATER QUALITY MONITORING

Sampling Locations

Responsible Agency: Saskatchewan Environment

Sampling Frequency: Annually

Station Description

Station	SPC Piezometer No.	Sampling Elevation (m)	Material
8a	C726A	746.338	unoxidized till
	C726B	751.040	mottled till
	C726C	752.739	oxidized till
	C726D	755.543	oxidized till
8a	C726E	738.725	empress gravel
9a	C728A	753.405	oxidized till
	C728B	743.265	unoxidized till
	C728C	747.645	mottled till
	C728D	752.305	oxidized till
9a	C728E	739.912	empress gravel
2a	C712B	746.112	oxidized till
2b	C718	748.385	mottled till
2c	C719	747.715	oxidized till
C533	C533	740.441	empress gravel
C534	C534	753.499	till
18	C741	735.153	empress gravel
19	C735	753.789	empress gravel
21	C742	741.800	empress gravel

Parameters

Responsible Agency: Saskatchewan Environment

ESQUAOAT* Code	Parameter	Analytical Method	Sampling Frequency Station No:
10101	Alkalinity-tot	Pot-Titration	Note:
13032	Aluminum-tot	AA-HNO ₃	All stations in the
33034	Arsenic-total	Flameless AA	preceding station
56001	Barium-tot	AA-HNO ₃	list are sampled
06201	Bicarbonates	Calculated	annually in the fall.
05106	Boron-diss	Colourimetric	
48002	Cadmium-tot	AA-HNO ₃	
20103	Calcium	AA-direct	
06301	Carbonates	Calculated	
17203	Chloride	Colourimetric	
24002	Chromium-tot	AA-HNO ₃	
27002	Cobalt-tot	AA-HNO ₃	
02011	Colour	Comparator	
02041	Conductivity	Wheatstone Bridge	
29005	Copper-tot		
09107	Fluoride	Electrometric	
26004	Iron-tot	AA-HNO ₃	
82002	Lead-tot	AA-HNO ₃	
03001	Lithium-tot	AA-HNO ₃	
12102	Magnesium	AA-direct	
25004	Manganese-tot		
80011	Mercury-tot	Flameless AA	
42001	Molybdenum	AA-HNO ₃	
28002	Nickel-total	AA-HNO ₃	
07110	Nitrate	Colourimetric	
10301	pH	Electrometric	
19103	Potassium		
34005	Selenium-tot	Colourimetric	
14101	Silica	Colourimetric	
11103	Sodium	Flame Emission	
38001	Strontium-tot	AA-HNO ₃	
16306	Sulphate	Colourimetric	
10451	TDS	Gravimetric	
92101	Uranium	Fluorometry	
23002	Vanadium-tot	AA-HNO ₃	
97025	Water Level		
30005	Zinc-tot	AA-HNO ₃	

*Computer Storage and Retrieval System - Saskatchewan Environment
Symbols: AA-atomic absorption

R 26



GROUNDWATER QUALITY MONITORING

Ground Water Quality

Annual Sampling

LOCATION: 8a C726A

DATE

1981

1981

1981

1982

APR.

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level	m	755.10	754.01	750.22	748.13
TDS (sum of ions)	mg/L	849	530	700	1020
pH		7.74	8.36	7.67	7.77
conductivity	us/cm	1290	1070	1200	1440
HCO ₃	mg/L	598	349	508	685
CO ₃	mg/L				
Cl	mg/L	21	22	21	23
SO ₄	mg/L	156	154	154	300
Ca	mg/L	117	26	68	154
Mg	mg/L	56	48	51	81
K	mg/L	8.4	8.8	8.0	8.8
Na	mg/L	92	85	84	99
Fe	mg/L	0.57	0.79	24.8	0.12
Mn	mg/L	1.7	1.81	2.5	2.1
Total Alkalinity/Acidity	mg/L	490	291	417	562
NO ₃ -N	mg/L	0.005	0.015	0.032	
Apparent Colour	mg/L	5	5	5	15
Ba	mg/L	0.1	LO.1	LO.1	0.9
F	mg/L	0.35	0.13	0.2	0.29
Cu	mg/L	0.25	0.36	0.063	0.003
Zn	mg/L	0.028	0.011	0.015	0.038
Cd	mg/L	LO.001	LO.001	0.005	<0.001
Cr	mg/L	0.01	0.01	0.03	<0.001
Al	mg/L	1.02	1.06	14.80	0.18
Pb	mg/L	LO.004	0.028	0.04	<0.004
Hg	mg/L	LO.0001	LO.0001	0.0002	<0.0001
Mo	mg/L	LO.05	0.09	LO.05	0.004
Sr	mg/L	0.65	0.85	0.94	1.15
Co	mg/L	0.004	0.005	0.012	0.007
Se	mg/L	0.0003	LO.0002	LO.0002	0.0003
V	mg/L	LO.004	LO.004	0.016	0.001
Silica	mg/L	18.8	17.5	19.5	16.8
As	mg/L	0.002	0.0022	0.009	0.0006
U	mg/L	0.0001	0.0077	0.020	0.0244
Li	mg/L	0.105	0.105	0.147	0.142
B	mg/L	0.5	0.55	0.55	0.56

Ground Water Quality

Annual Sampling

LOCATION: 8a C7268

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m	755.18	755.19	754.72	753.71
TDS (sum of ions)	mg/L	65000	68500	85000	*
pH		7.44	7.98	7.48	7.35
conductivity	us/cm	10010	49021	48300	
HCO ₃	mg/L	1550	1605	973	*
CO ₃	mg/L				
Cl	mg/L	240	222	200	233
SO ₄	mg/L	76000	50200	59000	*
Ca	mg/L	590	437	418	500
Mg	mg/L	14200	10950	12700	*
K	mg/L	335	300	314	369
Na	mg/L	7800	5500	6500	8100
Fe	mg/L	0.11	0.15	1.8	0.41
Mn	mg/L	1.41	1.78	3.4	3.24
Total Alkalinity/Acidity	mg/L	1270	1316	7970	1330
NO ₃ -N	mg/L	0.004	0.025	0.037	
Apparent Colour	mg/L	500	500	600	600
Ba	mg/L	LO.1	0.1	1.4	1.6
F	mg/L	0.43	0.25	0.32	0.32
Cu	mg/L	0.45	0.49	0.07	0.099
Zn	mg/L	0.08	0.04	0.03	0.19
Cd	mg/L	LO.001	LO.001	0.012	0.001
Cr	mg/L	LO.01	0.09	0.12	<0.001
Al	mg/L	0.03	1.4	1.57	0.54
Pb	mg/L	0.022	0.027	0.049	0.083
Hg	mg/L	LO.0001	LO.0001	0.0002	<0.0001
Mo	mg/L	LO.05	0.05	0.34	0.004
Sr	mg/L	15.0	23.0	16.8	15.5
Co	mg/L	0.066	0.071	0.064	0.055
Se	mg/L	0.002	LO.0002	LO.0002	0.0002
V	mg/L	0.004	LO.004	0.008	0.043
Silica	mg/L	7.3	6.3	8.5	7.1
As	mg/L	LO.0002	0.016	0.0029	0.0016
U	mg/L	LO.0001	0.0003	0.400	1.120
Li	mg/L	8.3	8.3	9.14	6.7
B	mg/L	1.25	1.4	1.43	1.10

* Too high for eqy.t

Ground Water Quality

Annual Sampling

LOCATION: 8a C726C

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m	754.92	755.05	755.17	755.50
TDS (sum of ions)	mg/L	989	540	1200	1250
pH		7.86	8.51	7.91	7.94
conductivity	us/cm	1370	1080	1700	1880
HCO ₃	mg/L	617	352	605	712
CO ₃	mg/L				
Cl	mg/L	4.0	3.9	4.5	4.9
SO ₄	mg/L	310	189	500	500
Ca	mg/L	73	23	81	94
Mg	mg/L	94	81	122	160
K	mg/L	29.5	22.0	30	28
Na	mg/L	88	35	161	85
Fe	mg/L	0.51	0.15	0.64	0.05
Mn	mg/L	0.11	0.11	0.1	0.14
Total Alkalinity/Acidity	mg/L	506	305	496	584
NO ₃ -N	mg/L	0.004	0.028	0.018	
Apparent Colour	mg/L	5	5	15	15
Ba	mg/L	10.1	0.1	10.1	0.7
F	mg/L	0.45	0.17	0.29	0.39
Cu	mg/L	0.31	0.35	0.14	0.058
Zn	mg/L	0.024	0.068	0.069	0.088
Cd	mg/L	10.001	10.001	0.006	<0.001
Cr	mg/L	0.01	10.01	0.01	<0.001
Al	mg/L	0.84	0.24	0.56	0.58
Pb	mg/L	0.007	0.023	0.046	<0.004
Hg	mg/L	10.0001	10.0001	0.0002	<0.001
Mo	mg/L	10.05	0.05	10.05	0.001
Sr	mg/L	0.1	0.56	0.84	0.92
Co	mg/L	0.002	10.001	10.001	0.003
Se	mg/L	0.0003	10.0002	10.0002	0.0002
V	mg/L	10.004	10.004	10.004	0.003
Silica	mg/L	21.7	22.5	21.7	21.5
As	mg/L	0.0009	0.0014	0.0006	0.0006
U	mg/L	0.0001	0.0082	0.092	0.071
Li	mg/L	0.21	0.188	0.24	0.25
B	mg/L	0.36	0.38	0.4	0.4

Ground Water Quality

Annual Sampling

LOCATION: 8a C726D

DATE

1981

1981

1981

1982

APR.

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level	m				
TDS (sum of ions)	mg/L				
pH					
conductivity	us/cm				
HCO ₃	mg/L				
CO ₃	mg/L				
Cl	mg/L				
SO ₄	mg/L				
Ca	mg/L				
Mg	mg/L				
K	mg/L				
Na	mg/L				
Fe	mg/L	D	D	D	D
Mn	mg/L	R	R	R	R
Total Alkalinity/Acidity	mg/L	Y	Y	Y	Y
NO ₃ -N	mg/L				
Apparent Colour	mg/L				
Ba	mg/L				
F	mg/L				
Cu	mg/L				
Zn	mg/L				
Cd	mg/L				
Cr	mg/L				
Al	mg/L				
Pb	mg/L				
Hg	mg/L				
Mo	mg/L				
Sr	mg/L				
Co	mg/L				
Se	mg/L				
V	mg/L				
Silica	mg/L				
As	mg/L				
U	mg/L				
Li	mg/L				
B	mg/L				

Ground Water Quality

Annual Sampling

LOCATION: 8a C726E

DATE

1981

1981

1981

1982

MAR.

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level	m	751.72	751.63	751.35	751.88
TOS (sum of ions)	mg/L		500	725	775
pH			8.33	7.68	7.68
conductivity	us/cm		1060	1170	1170
HCO ₃	mg/L		349	562	611
CO ₃	mg/L				
Cl	mg/L		4.5	4.5	4.3
SO ₄	mg/L		172	180	188
Ca	mg/L		29	88	113
Mg	mg/L		62	66	82
K	mg/L		7.7	6.8	7.1
Na	mg/L		47	58	59
Fe	mg/L		0.67	0.77	0.03
Mn	mg/L		0.24	0.17	0.32
Total Alkalinity/Acidity	mg/l		238	461	501
NO ₃ -N	mg/L		0.016	0.026	
Apparent Colour	mg/L		5	15	15
Ba	mg/L		10.1	1.1	0.6
F	mg/L		0.18	0.30	0.35
Cu	mg/L		0.25	0.04	0.02
Zn	mg/L		0.027	0.014	0.061
Cd	mg/L		10.001	0.002	<0.001
Cr	mg/L		10.01	10.01	<0.001
Al	mg/L		0.79	0.25	0.21
Pb	mg/L		0.039	0.055	<0.004
Hg	mg/L		0.0002	0.0002	<0.0001
Mo	mg/L		10.05	10.05	<0.001
Sr	mg/L		1.25	1.23	1.07
Co	mg/L		0.004	10.001	0.002
Se	mg/L		0.0004	10.0002	<0.0002
V	mg/L		10.004	10.004	<0.001
Silica	mg/L		17.5	18.7	17.1
As	mg/L		0.0029	0.0011	0.0006
U	mg/L		0.0004	0.005	0.007
Li	mg/L		0.069	0.077	0.092
B	mg/L		0.78	0.77	0.68

Ground Water Quality

Annual Sampling

LOCATION: 9a C728A

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m				
TDS (sum of ions)	mg/L				
pH					
conductivity	us/cm				
HCO ₃	mg/L				
CO ₃	mg/L				
Cl	mg/L				
SO ₄	mg/L				
Ca	mg/L				
Mg	mg/L				
K	mg/L				
Na	mg/L				
Fe	mg/L				
Mn	mg/L				
Total Alkalinity/Acidity	mg/L				
NO ₃ -N	mg/L	D	D	D	D
Apparent Colour	mg/L				
Ba	mg/L	R	R	R	R
F	mg/L				
Cu	mg/L	Y	Y	Y	Y
Zn	mg/L				
Cd	mg/L				
Cr	mg/L				
Al	mg/L				
Pb	mg/L				
Hg	mg/L				
Mo	mg/L				
Sr	mg/L				
Co	mg/L				
Se	mg/L				
V	mg/L				
Silica	mg/L				
As	mg/L				
U	mg/L				
Li	mg/L				
B	mg/L				

Ground Water Quality

Annual Sampling

LOCATION: 9a C728B

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m	750.98	750.36	750.19	746.05
TDS (sum of ions)	mg/L	1360	1010	1150	1390
pH		7.84	7.92	7.65	7.55
conductivity	us/cm	1850	1750	1820	1920
HCO ₃	mg/L	632	414	565	761
CO ₃	mg/L				
Cl	mg/L	21	22	22	25
SO ₄	mg/L	484	447	469	513
Ca	mg/L	160	74	121	177
Mg	mg/L	85	73	78	91
K	mg/L	9.9	9.6	9.3	10.7
Na	mg/L	170	143	151	167
Fe	mg/L	0.66	1.35	0.72	10.6
Mn	mg/L	0.76	0.67	0.67	1.94
Total Alkalinity/Acidity	mg/L	518	340	463	624
NO ₃ -N	mg/L	0.005	0.015	0.010	
Apparent Colour	mg/L	5	10	15	25
Ba	mg/L	0.1	10.1	0.8	1.4
F	mg/L	0.35	0.13	0.19	0.37
Cu	mg/L	0.31	0.27	0.093	0.16
Zn	mg/L	0.025	0.025	0.03	0.59
Cd	mg/L	10.001	10.001	0.001	0.004
Cr	mg/L	0.02	10.01	10.01	0.01
Al	mg/L	1.27	1.54	0.38	1.71
Pb	mg/L	0.004	0.033	0.057	0.058
Hg	mg/L	10.0001	10.0001	0.0002	<0.0001
Mo	mg/L	10.05	10.05	0.06	<0.001
Sr	mg/L	1.30	1.6	1.55	1.82
Co	mg/L	0.003	0.007	0.003	0.017
Se	mg/L	10.0002	0.0003	10.0002	<0.0002
V	mg/L	10.004	0.007	10.004	0.027
Silica	mg/L	15.7	15.5	16.5	17.1
As	mg/L	0.0037	0.0056	0.0005	0.010
U	mg/L	10.0001	0.0055	0.0018	0.0158
Li	mg/L	0.12	0.113	0.126	0.135
B	mg/L	1.23	1.28	1.30	1.35

Ground Water Quality

Annual Sampling

LOCATION: 9a C728C

DATE	1981	1981	1981	1982
	MAR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC

PARAMETERS

Water Level	m			748.51	748.45
TDS (sum of ions)	mg/L			2100	2550
pH				7.54	7.60
conductivity	us/cm			2800	3080
HCO ₃	mg/L			609	637
CO ₃	mg/L				
Cl	mg/L			67	79
SO ₄	mg/L			1070	1370
Ca	mg/L			234	330
Mg	mg/L			120	148
K	mg/L			10.8	12.8
Na	mg/L			225	259
Fe	mg/L			1.6	6.54
Mn	mg/L			1.4	4.5
Total Alkalinity/Acidity	mg/L	D	O	500	522
NO ₃ -N	mg/L			0.68	
Apparent Colour	mg/L	R	R	15	15
Ba	mg/L			0.2	1.6
F	mg/L	Y	Y	0.15	0.22
Cu	mg/L			0.048	0.100
Zn	mg/L			0.013	0.150
Cd	mg/L			0.002	<0.001
Cr	mg/L			0.03	0.02
Al	mg/L			0.53	1.38
Pb	mg/L			0.43	0.043
Hg	mg/L			0.0002	<0.0001
Mo	mg/L			0.12	0.001
Sr	mg/L			1.79	2.21
Co	mg/L			0.005	0.03
Se	mg/L			0.0002	<0.0002
V	mg/L			0.004	0.041
Silica	mg/L			17.7	15.0
As	mg/L			0.001	0.0048
U	mg/L			0.0013	0.0173
Li	mg/L			0.22	0.25
B	mg/L			0.8	0.79

Ground Water Quality

Annual Sampling

LOCATION: 9: 0729D

DATE

1981

1981

1981

1982

JULY

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level m
TDS (sum of ions) mg/L
pH
conductivity us/cm
HCO₃ mg/L
CO₃ mg/L
Cl mg/L
SO₄ mg/L
Ca mg/L
Mg mg/L
K mg/L
Na mg/L
Fe mg/L
Mn mg/L
Total Alkalinity/Acidity mg/L
NO₃-N mg/L
Apparent Colour mg/L
Ba mg/L
F mg/L
Cu mg/L
Zn mg/L
Cd mg/L
Cr mg/L
Al mg/L
Pb mg/L
Hg mg/L
Mo mg/L
Sr mg/L
Co mg/L
Se mg/L
V mg/L
Silica mg/L
As mg/L
U mg/L
Li mg/L
B mg/L

D

D

D

D

R

R

R

R

Y

Y

Y

Y

Ground Water Quality

Annual Sampling

LOCATION: 9a C728E

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m	751.94	751.68	751.23	751.99
TDS (sum of ions)	mg/L	957	570	800	805
pH		7.83	8.16	7.67	7.70
conductivity	us/cm	1350	1220	1300	1220
HCO ₃	mg/L	746	461	620	690
CO ₃	mg/L				
Cl	mg/L	9.4	9.1	8.9	6.6
SO ₄	mg/L	187	140	192	157
Ca	mg/L	120	36	90	117
Mg	mg/L	68	62	64	70
K	mg/L	8.2	9.1	7.9	8.3
Na	mg/L	96	73	84	74
Fe	mg/L	9.9	2.26	1.40	0.11
Mn	mg/L	0.75	0.57	0.52	0.38
Total Alkalinity/Acidity	mg/L	612	378	508	566
NO ₃ -N	mg/L	0.003	0.017	0.023	
Apparent Colour	mg/L	5	5	15	15
Ba	mg/L	0.1	0.2	0.7	0.7
F	mg/L	0.46	0.17	0.27	0.23
Cu	mg/L	0.220	0.34	0.033	0.008
Zn	mg/L	LO.001	0.02	0.017	0.052
Cd	mg/L	LO.001	LO.001	0.003	<0.001
Cr	mg/L	0.01	0.03	0.02	<0.001
Al	mg/L	0.93	0.11	0.76	0.29
Pb	mg/L	0.006	0.012	0.062	<0.004
Hg	mg/L	LO.0001	LO.0001	0.0002	<0.0001
Mo	mg/L	0.02	LO.05	LO.05	0.016
Sr	mg/L	1.10	1.31	1.38	1.50
Co	mg/L	LO.001	0.002	LO.001	0.007
Se	mg/L	LO.0002	0.0003	LO.0002	<0.0002
V	mg/L	LO.004	LO.004	LO.004	<0.001
Silica	mg/L	17.4	16.4	17.7	13.3
As	mg/L	0.095	0.003	0.0006	0.0021
U	mg/L	0.0005	0.0002	0.0034	0.004
Li	mg/L	0.081	0.075	0.096	0.090
B	mg/L	1.08	1.10	1.17	1.10

Ground Water Quality

Annual Sampling

LOCATION: 2a C712B

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC

PARAMETERS

Water Level	m	752.57	752.39	752.53	753.15
TDS (sum of ions)	mg/L	1270	1480	2800	2600
pH		8.0	8.11	7.9	7.73
conductivity	us/cm	1710	2100	3192	2090
HCO ₃	mg/L	416	312	377	392
CO ₃	mg/L				
Cl	mg/L	18	25	47	76
SO ₄	mg/L	654	835	1710	1570
Ca	mg/L	173	217	470	442
Mg	mg/L	90	102	160	159
K	mg/L	10.1	11.0	12.0	11.7
Na	mg/L	129	95	124	134
Fe	mg/L	2.49	1.71	4.4	0.10
Mn	mg/L	0.80	0.23	0.26	0.02
Total Alkalinity/Acidity	mg/L	341	256	309	321
NO ₃ -N	mg/L	1.56	2.5	6.7	
Apparent Colour	mg/L	35	20	45	75
Ba	mg/L	LO.1	LO.1	0.8	2.6
F	mg/L	0.38	0.26	0.30	1.60
Cu	mg/L	0.27	0.76	0.029	0.013
Zn	mg/L	0.05	0.025	0.003	0.048
Cd	mg/L	LO.001	LO.001	0.004	0.001
Cr	mg/L	0.02	0.20	0.02	0.01
Al	mg/L	1.5	3.0	2.26	0.26
Pb	mg/L	0.004	0.033	0.012	<0.004
Hg	mg/L	0.0002	0.0001	-0.0002	<0.0001
Mo	mg/L	0.01	0.12	LO.05	0.002
Sr	mg/L	0.65	1.0	1.91	2.05
Co	mg/L	0.001	0.005	0.003	0.002
Se	mg/L	0.0025	0.0062	0.0013	0.0004
V	mg/L	0.006	0.011	0.013	0.015
Silica	mg/L	19.4	20.0	20.5	20.8
As	mg/L	0.0023	0.0096	0.0024	0.0005
U	mg/L	0.0007	0.0716	0.070	0.207
Li	mg/L	0.102	0.094	0.150	0.140
B	mg/L	0.56	0.58	0.5	0.51

Ground Water Quality

Annual Sampling

LOCATION: 2b C718

DATE		1981	1981	1981	1982
		APR.	JULY	NOV.	Oct.
AGENCY		SPC	SPC	SPC	SPC
PARAMETERS					
Water Level	m	752.49	752.36	751.43	752.12
TDS (sum of ions)	mg/L		570	775	650
pH			8.07	7.85	7.58
conductivity	us/cm		1130	1210	1010
HCO ₃	mg/L		418	566	478
CO ₃	mg/L				
Cl	mg/L		12	13	9
SO ₄	mg/L		142	171	172
Ca	mg/L		46	96	100
Mg	mg/L		54	60	50
K	mg/L		7.4	6.8	
Na	mg/L		65	73	68
Fe	mg/L		0.65	1.2	2.06
Mn	mg/L		0.6	0.56	0.20
Total Alkalinity/Acidity	mg/L		343	464	392
NO ₃ -N	mg/L		0.91	1.02	
Apparent Colour	mg/L		10	15	25
Ba	mg/L		10.1	0.8	0.6
F	mg/L		0.14	0.2	0.37
Cu	mg/L		0.25	0.028	0.007
Zn	mg/L		0.034	0.008	0.040
Cd	mg/L		0.003	0.005	<0.001
Cr	mg/L		10.01	0.01	<0.001
Al	mg/L		0.92	1.63	0.45
Pb	mg/L		0.038	0.033	<0.004
Hg	mg/L		10.0001	0.0002	<0.0001
Mo	mg/L		0.03	10.05	0.003
Sr	mg/L		0.56	0.70	0.62
Co	mg/L		0.003	0.001	0.002
Se	mg/L		0.0037	10.0002	0.0005
V	mg/L		10.034	0.004	0.001
Silica	mg/L		19.0	19.5	18.9
As	mg/L		0.0008	0.0007	0.0008
U	mg/L		0.028	0.068	0.040
Li	mg/L		0.101	0.166	0.110
B	mg/L		0.44	0.50	0.53

Ground Water Quality

Annual Sampling

LOCATION: 2c C719

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m	752.67	751.84	751.69	752.69
TDS (sum of ions)	mg/L		3350	3900	4000
pH			7.63	7.61	7.66
conductivity	us/cm		4398	4520	4640
HCO ₃	mg/L		430	606	653
CO ₃	mg/L				
Cl	mg/L		107	110	94
SO ₄	mg/L		2000	2250	2390
Ca	mg/L		387	494	452
Mg	mg/L		241	241	234
K	mg/L		10.0	11.9	12.4
Na	mg/L		350	410	420
Fe	mg/L		1.23	0.51	1.08
Mn	mg/L		0.02	0.03	0.05
Total Alkalinity/Acidity	mg/L		353	497	544
NO ₃ -N	mg/L		16.8	18.0	
Apparent Colour	mg/L		10	15	25
Ba	mg/L		0.2	0.1	1.7
F	mg/L		0.14	0.22	0.35
Cu	mg/L		0.29	0.01	0.009
Zn	mg/L		0.035	0.016	0.027
Cd	mg/L		10.001	0.003	<0.001
Cr	mg/L		0.02	0.04	0.02
Al	mg/L		1.38	0.89	0.49
Pb	mg/L		0.044	0.015	<0.004
Hg	mg/L		10.0001	0.0002	<0.0001
Mo	mg/L		10.05	0.15	0.002
Sr	mg/L		2.47	1.65	2.35
Co	mg/L		10.001	10.001	0.001
Se	mg/L		0.163	0.0015	0.066
V	mg/L		10.004	10.004	<0.001
Silica	mg/L		21.4	22.0	22.1
As	mg/L		0.0033	0.0007	0.0004
U	mg/L		0.167	0.220	0.196
Li	mg/L		0.28	0.154	0.320
B	mg/L		0.93	1.5	1.01

Ground Water Quality

Annual Sampling

LOCATION: C533

DATE

1981

1981

1981

1982

APR.

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level	m	751.43	751.23	750.89	751.41
TDS (sum of ions)	mg/L	1090	791	950	990
pH		8.1	8.22	7.8	7.64
conductivity	us/cm	1510	1470	1490	1490
HCO ₃	mg/L	778	483	628	787
CO ₃	mg/L				
Cl	mg/L	4.4	4.3	4.1	5.5
SO ₄	mg/L	272	247	249	252
Ca	mg/L	109	31	83	114
Mg	mg/L	78	66	71	72
K	mg/L	9.1	9.4	9.2	9.7
Na	mg/L	147	126	152	139
Fe	mg/L	0.69	0.68	3.1	0.03
Mn	mg/L	0.3	0.27	0.26	0.29
Total Alkalinity/Acidity	mg/L	628	400	564	645
NO ₃ -N	mg/L	0.013	0.019	0.024	
Apparent Colour	mg/L	5	5	15	15
Ba	mg/L	0.1	0.1	0.7	0.4
F	mg/L	0.07	0.09	0.23	0.27
Cu	mg/L	0.11	0.17	0.013	0.003
Zn	mg/L	10.4	9.3	9.1	13.7
Cd	mg/L	LO.001	LO.001	0.003	<0.001
Cr	mg/L	0.01	LO.01	0.04	<0.001
Al	mg/L	0.42	0.80	0.66	0.11
Pb	mg/L	0.009	0.026	0.061	0.005
Hg	mg/L	LO.0001	LO.0001	LO.0001	<0.0001
Mo	mg/L	0.02	LO.05	LO.05	0.004
Sr	mg/L	1.2	1.5	1.55	1.80
Co	mg/L	0.002	0.006	LO.001	0.002
Se	mg/L	LO.0002	0.0002	LO.0002	<0.0002
V	mg/L	LO.004	LO.004	LO.004	<0.001
Silica	mg/L	14.7	14.3	15.3	13.4
As	mg/L	0.0015	0.0027	0.0042	0.0012
U	mg/L	0.0001	LO.0001	0.0508	0.0020
Li	mg/L	0.121	0.101	0.123	0.120
B	mg/L	2.03	1.98	2.15	2.19

Ground Water Quality

Annual Sampling

LOCATION: C534

DATE

1981

1981

1981

1982

APR.

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level	m	757.62	757.62	757.45	757.49
TDS (sum of ions)	mg/L	4250	3700	3500	4500
pH		7.70	7.71	7.68	7.54
conductivity	us/cm	5160	4839	5060	5390
HCO ₃	mg/L	656	230	588	702
CO ₃	mg/L				
Cl	mg/L	298	298	5	300
SO ₄	mg/L	2320	2140	2250	2490
Ca	mg/L	539	455	543	540
Mg	mg/L	339	300	312	360
K	mg/L	17.0	11.0	9.2	16.4
Na	mg/L	337	327	17	370
Fe	mg/L	0.25	0.32	0.21	1.5
Mn	mg/L	0.12	0.18	0.21	0.10
Total Alkalinity/Acidity	mg/L	538	189	482	576
NO ₃ -N	mg/L	32	32	41	
Apparent Colour	mg/L	10	10	15	15
Ba	mg/L	LO.1	0.1	LO.1	0.6
F	mg/L	0.32	0.11	0.21	0.23
Cu	mg/L	0.18	0.14	0.012	0.020
Zn	mg/L	18.7	19.6	35.00	23.20
Cd	mg/L	LO.001	LO.001	LO.001	<0.001
Cr	mg/L	LO.01	LO.01	LO.01	0.02
Al	mg/L	0.04	0.42	0.5	0.53
Pb	mg/L	LO.004	0.12	0.02	0.007
Hg	mg/L	0.0001	0.0002	0.0002	<0.0001
Mo	mg/L	0.02	0.06	0.12	0.003
Sr	mg/L	1.8	3.1	2.16	3.54
Co	mg/L	LO.001	0.003	LO.001	0.002
Se	mg/L	0.024	0.0097	0.0014	0.0042
V	mg/L	LO.004	LO.004	LO.004	0.006
Silica	mg/L	13.6	14.6	16.7	17.9
As	mg/L	LO.0002	0.0008	0.0006	0.0006
U	mg/L	.0022	LO.0001	0.0772	0.208
Li	mg/L	0.43	0.41	0.47	0.46
B	mg/L	0.72	0.73	0.5	0.80

Ground Water Quality

Annual Sampling

LOCATION: 18 C741

DATE

1981

1981

1981

1982

APR.

JULY

NOV.

OCT.

AGENCY

SPC

SPC

SPC

SPC

PARAMETERS

Water Level	m	746.49	747.24	746.48	746.59
TDS (sum of ions)	mg/L	1090	850	975	1150
pH		7.86	8.19	7.69	7.67
conductivity	us/cm	1540	1430	1560	1560
HCO ₃	mg/L	706	485	574	676
CO ₃	mg/L				
Cl	mg/L	7.7	6.4	9.3	7.1
SO ₄	mg/L	306	243	318	394
Ca	mg/L	111	35	76	123
Mg	mg/L	60	48	56	68
K	mg/L	8.3	8.7	8.5	8.5
Na	mg/L	171	163	166	179
Fe	mg/L	1.17	1.75	1.10	1.78
Mn	mg/L	0.25	0.11	0.16	0.30
Total Alkalinity/Acidity	mg/L	579	398	471	554
NO ₃ -N	mg/L	1.14	0.53	1.91	
Apparent Colour	mg/L	5	5	15	15
Ba	mg/L	0.1	0.1	0.2	0.6
F	mg/L	0.32	0.21	0.30	0.37
Cu	mg/L	0.19	0.24	0.036	0.058
Zn	mg/L	0.038	0.077	0.013	0.100
Cd	mg/L	LO.001	LO.001	0.006	0.002
Cr	mg/L	0.01	0.06	LO.01	<0.001
Al	mg/L	0.75	1.06	0.65	0.79
Pb	mg/L	LO.004	0.008	0.11	0.006
Hg	mg/L	0.0001	LO.0001	0.0002	<0.0001
Mo	mg/L	0.02	0.03	0.11	0.001
Sr	mg/L	1.7	2.0	1.85	1.70
Co	mg/L	LO.001	0.004	LO.001	0.002
Se	mg/L	0.001	0.0019	LO.0002	0.0006
V	mg/L	LO.004	LO.004	0.004	<0.001
Silica	mg/L	13.0	13.0	15.0	12.2
As	mg/L	0.0011	0.0027	0.0007	0.001
U	mg/L	0.0001	0.0003	0.004	0.004
Li	mg/L	0.112	0.105	0.118	0.120
B	mg/L	2.00	2.00	2.00	1.96

Ground Water Quality

Annual Sampling

LOCATION: 19 C735

DATE	1981	1981	1981	1982
	APR	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m				
TDS (sum of ions)	mg/L				
pH					
conductivity	us/cm				
HCO ₃	mg/L				
CO ₃	mg/L				
Cl	mg/L				
SO ₄	mg/L				
Ca	mg/L				
Mg	mg/L				
K	mg/L				
Na	mg/L	D	D	D	D
Fe	mg/L	R	R	R	R
Mn	mg/L	Y	Y	Y	Y
Total Alkalinity/Acidity	mg/L				
NO ₃ -N	mg/L				
Apparent Colour	mg/L				
Ba	mg/L				
F	mg/L				
Cu	mg/L				
Zn	mg/L				
Cd	mg/L				
Cr	mg/L				
Al	mg/L				
Pb	mg/L				
Hg	mg/L				
Mo	mg/L				
Sr	mg/L				
Co	mg/L				
Se	mg/L				
V	mg/L				
Silica	mg/L				
As	mg/L				
U	mg/L				
Li	mg/L				
B	mg/L				

Ground Water Quality

Annual Sampling

LOCATION: 21 C742

DATE	1981	1981	1981	1982
	APR.	JULY	NOV.	OCT.
AGENCY	SPC	SPC	SPC	SPC
PARAMETERS				

Water Level	m	746.95	746.90	746.75	747.46
TOS (sum of ions)	mg/L	975	775	925	990
pH		7.89	7.94	7.72	7.33
conductivity	us/cm	1370	1350	1340	1410
HCO ₃	mg/L	407	285	418	427
CO ₃	mg/L				
Cl	mg/L	13	13	13	11
SO ₄	mg/L	419	390	403	335
Ca	mg/L	131	85	130	13.2
Mg	mg/L	90	81	82	81
K	mg/L	7.4	8.7	7.7	7.7
Na	mg/L	51	44	55	50
Fe	mg/L	1.27	1.45	0.87	3.16
Mn	mg/L	0.17	0.17	0.08	0.14
Total Alkalinity/Acidity	mg/L	334	234	343	350
NO ₃ -N	mg/L	0.3	0.21	0.072	
Apparent Colour	mg/L	5	5	15	15
Ba	mg/L	0.1	0.2	0.2	0.7
F	mg/L	0.35	0.12	0.22	0.25
Cu	mg/L	0.17	0.20	0.037	0.046
Zn	mg/L	0.12	0.02	0.036	0.110
Cd	mg/L	LO.001	LO.001	0.003	0.001
Cr	mg/L	0.01	LO.01	0.03	<0.001
Al	mg/L	0.43	0.46	0.36	0.38
Pb	mg/L	0.009	0.01	0.14	<0.004
Hg	mg/L	LO.0001	LO.0001	0.0003	<0.0001
Mo	mg/L	LO.05	0.05	LO.05	0.001
Sr	mg/L	1.5	2.1	2.03	2.01
Co	mg/L	LO.001	LO.001	LO.001	<0.001
Se	mg/L	0.0002	LO.0002	LO.0002	0.0003
V	mg/L	LO.004	LO.004	LO.004	0.007
Silica	mg/L	10.7	10.6	11.5	9.50
As	mg/L	0.0007	0.0008	0.0008	0.0015
U	mg/L	0.0001	0.0003	0.0004	0.0026
Li	mg/L	0.09	0.09	0.108	0.100
B	mg/L	0.82	0.83	0.87	0.92

GROUNDWATER PIEZOMETERS-DRAWDOWN DATA

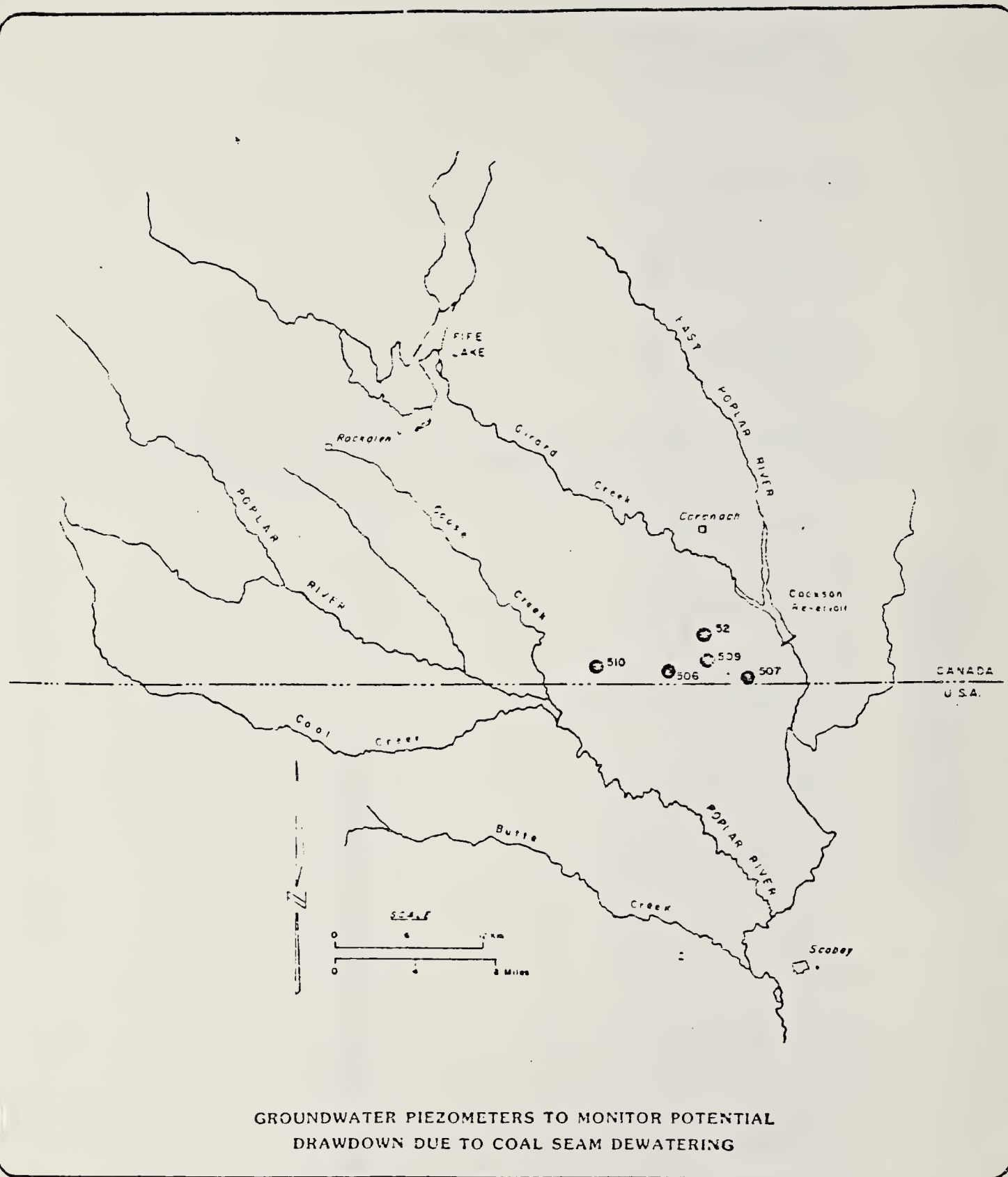
Ground Water Piezometers To Monitor
Potential Drawdown Due to Coal
Seam Dewatering-Water Elevation (m)

Piezometer	DOE Ref. No.	1981		1982												
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
52	52	753.68	753.61	753.63	753.4	753.65	753.72	753.70	753.77	753.95	753.63	753.5	753.34	753.14	753.13	753.07
506	506	764.88'	764.85'	*	764.86'		764.66	765.03'	765.05'	765.02'	764.49'	765.03'	765.07'	764.83'	765.00'	764.99'
507	507	*	746.08	*	746.07	746.06	746.03	746.12	746.34	**	745.94	746.48	746.47	746.46	746.47	746.47
509	509	753.6	753.54	*	753.62	753.66	753.74	753.81	753.73	753.88	753.25	753.84	753.85	753.79	753.90	753.96
510	510	777.52	777.41	777.47	777.50	777.36	777.51	777.39	777.45	777.50	777.52	777.58	777.60	777.58	777.65	777.63

* inaccessible

** no reading

' 506A well (506 damaged) - reference elevation approx. 830.57 m.



GROUNDWATER PIEZOMETERS TO MONITOR

POTENTIAL DRAWDOWN DUE TO COAL

SEAM DEWATERING

Responsible Agency: Saskatchewan Environment

Measurement Frequency: Quarterly

<u>SPC Piezometer No.</u>	<u>Location</u>	<u>Sampling Elevation (m)</u>	<u>Perforation Zone (depth in metres)</u>
52	NW14-1-27W3	738.43	43 - 49 (in coal)
506	SW4-1-27 W3	748.27	81 - 82 (in coal)
507	SW6-1-26 W3	725.27	34 - 35 (in coal)
509	NW11-1-27W3	725.82	76 - 77 (in coal)
510	NW1-1-28 W3	769.34	28 - 29 (in layered coal and clay)

GROUNDWATER PIEZOMETER LEVEL MONITORING-
ASH LAGOON AREA DATA - PIZOMETERS IN TILL

GROUNDWATER PIEZOMETER LEVEL MONITORING - ASH LAGOON AREA

SCHEDULE A - PIEZOMETERS IN TILL

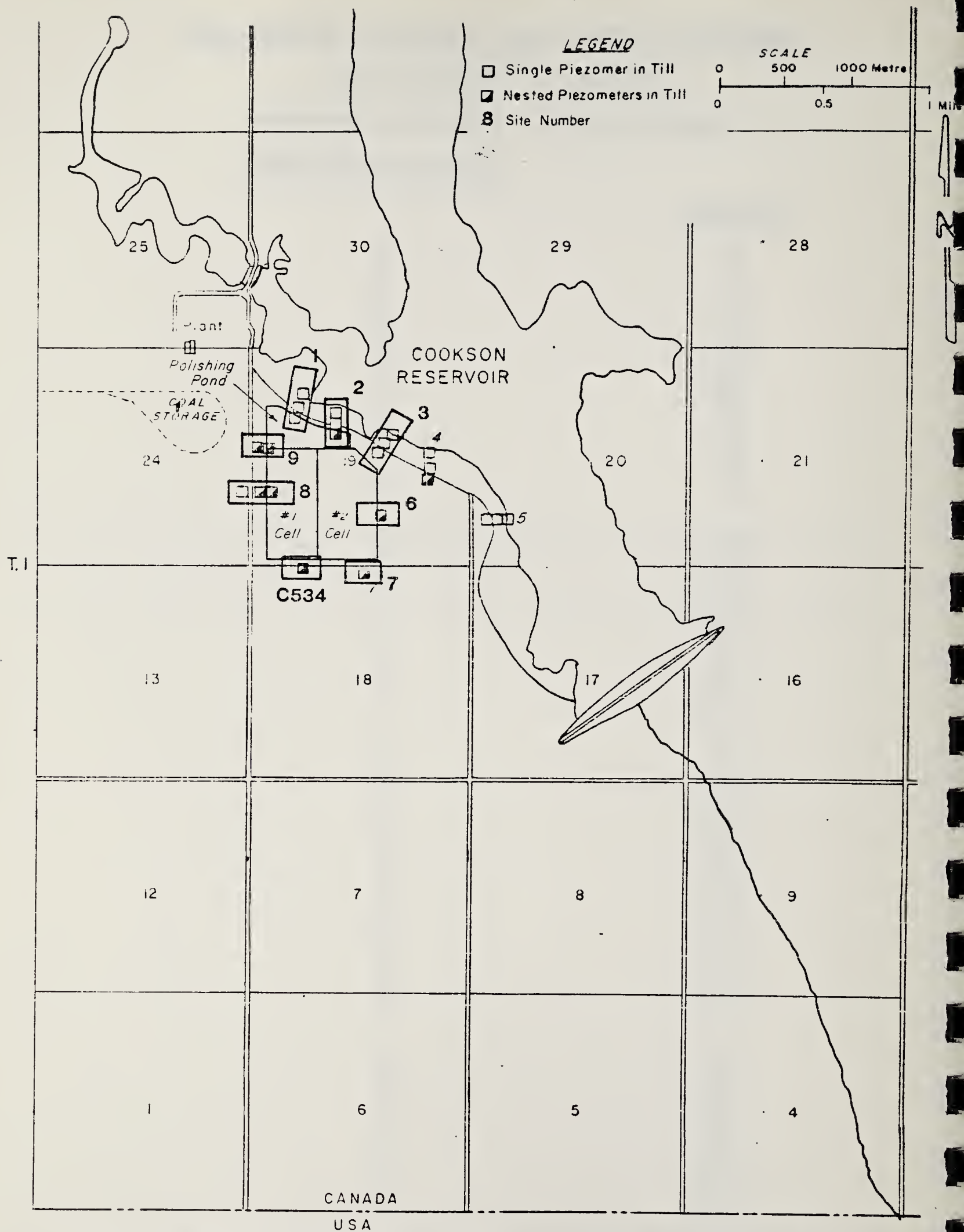
Responsible Agency: Saskatchewan Environment

Frequency of Measurement

Piezometer

1a	Q
1b	Q
1c	Q
2a	M
2a ₁	M
2a ₂	M
2a ₃	M
2a ₄	M
2b	M
2c	M
3a	Q
3b	Q
3c	Q
6a	Q
6a ₁	Q
6a ₂	Q
6a ₃	Q
6a ₄	Q
7a ₁	Q
7a ₂	Q
7a ₃	Q
7a ₄	Q
C534	M
8a ₁	M
8a ₂	M
8a ₃	M
8a ₄	M
8b ₁	Q
8b ₂	Q
8b ₃	Q
8b ₄	Q
8c ₁	Q
8c ₂	Q
8c ₃	Q
8c ₄	Q
8d	Q
9a ₁	M
9a ₂	M
9a ₃	M
9a ₄	M
9b ₁	Q
9b ₂	Q
9b ₃	Q
9b ₄	Q

Q - quarterly
M - monthly



POPLAR RIVER POWER STATION ASH LAGOON MONITORING STUDY

PIEZOMETER INSTALLATION SITES SCHEDULE "A" PIEZOMETERS IN TILL

Water Elevation (m) Ground Piezometer Level Monitoring-Asn - Schedule A - Piezometers in Till Water Elevation (m)

Piezometer	Ref. No.	1981												1982		
		4th Quarter			1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1a	C716		751.99	752.08	752.07			751.84			753.04			752.70		
	C717			751.81	751.80			752.03			752.74			752.64		
1c	C711			752.10	752.13			752.22			753.18			752.97		
2a1	C712A	751.88	751.71	751.86	751.85	751.84	751.82	751.79	752.40	752.61	752.72	752.69	752.65	752.57	752.54	752.75
2a2	C712B	752.16	752.52	752.11	751.12	752.13	751.99	751.85	753.15	752.24	753.12	753.07	752.89	753.15	752.75	752.75
2a3	C712C	751.80	751.61	751.72	751.70	751.69	751.71	751.78	751.94	752.13	752.33	752.35	752.40	752.43	752.37	752.45
2a4	C712D	751.21	751.07	751.26	751.24	751.23	751.25	751.27	751.27	751.32	751.81	751.93	752.06	752.10	752.07	752.22
2b	C718	752.21	751.43	752.10	752.08	752.07	752.04	751.97	751.18	748.93	751.07	753.00	750.71	752.12	752.34	752.73
2c	C719	751.80	751.69	751.85	751.85	751.83	751.92	752.23	753.10	753.25	752.87	752.72	752.59	752.69	752.66	752.62
3a	C713		751.95	752.03	752.02			751.90			753.02			752.65		
3b	C720			751.88	751.87			751.78			752.91			752.61		
3c	C721			751.92	751.82			751.80			752.86			752.60		
6a1	C763A		753.57	753.69	753.63			753.67			753.77			753.99		
6a2	C763B		Dry	Dry	Dry			Dry			Dry			Dry		
6a3	C763C			*	753.18			Damaged			753.07			753.05		
6a4	C763D			753.84	753.78			753.67			753.61			753.80		
7a1	C729A		752.88	752.90	752.89			752.94			753.31			753.65		
7a2	C729B			753.34	753.38			753.72			754.35			754.58		
7a3	C729C			753.57	753.65			754.20			755.14			755.17		
7a4	C729D		753.87	753.74	753.77			754.83			755.53			755.31		
C534	C534	757.55	757.46	757.53	757.55	757.49	757.53	757.77	757.70	757.86	757.73	758.01	758.07	757.49	757.79	758.08
8a1	C730A	754.95		754.88	754.74	754.60	754.74	754.74	**	755.17	755.31	755.24	755.17	754.89	754.88	754.95
8a2	C730B	758.04		757.82	757.75	757.54	758.11	758.38	**	758.18	758.32	758.18	758.11	758.18	757.82	757.97
8a3	C730C	755.28		755.63	754.85	754.50	755.63	754.15	**	754.22	754.08	754.08	754.08	754.15	754.14	754.15
8a4	C730D	756.06		755.99	755.92	755.85	756.06	755.92	**	755.99	756.34	756.34	756.20	756.35	755.99	756.13
8b1	C727A		751.29	751.89	751.70			752.47			752.99			753.11		
8b2	C727B		753.22	753.52	753.26			752.55			754.65			754.87		
8b3	C727C		754.67	754.68	754.55			755.46			755.87			755.07		
8c1	C726A		750.22	752.44	752.58			754.65			752.84			748.13		
8c2	C726B		754.72	755.35	755.34			755.45			754.44			753.71		
8c3	C726C		755.17	755.18	755.16			755.20			755.78			755.50		
8c4	C726D		Dry	Dry	Dry			Dry			Dry			Dry		
8d	C748				753.85			754.41			755.49			754.90		
9a1	C764A	752.98		753.26	753.33	753.40	753.40	753.26	**	753.19	753.33	753.26	753.33	753.54	753.40	753.82
9a2	C764B	752.86		753.14	753.14	753.28	753.14	753.21	**	753.42	753.70	753.84	754.12	754.48	754.41	754.90
9a3	C764C	752.84		752.84	752.84	752.98	752.91	752.34	**	752.98	752.98	753.05	753.27	753.48	753.48	753.41
9a4	C764D	752.1		752.03	752.10	751.67	750.27	752.58	**	753.36	753.15	753.08	752.94	752.66	751.81	752.17
9b1	C728A		Dry	Dry	Dry			Dry			Dry			Dry		
9b2	C728B		750.19	750.13	750.12			750.72			750.62			746.05		
9b3	C728C		748.51	Dry	748.34			748.98			748.41			748.45		
9b4	C728D		Dry	Dry	Dry			Dry			Dry			Dry		

Note: 3b4 Piezometer was deleted
 * pipe bent
 ** instrument malfunction

GROUNDWATER PIEZOMETER LEVEL MONITORING-
ASH LAGOON
AND INTERNATIONAL BOUNDARY AREA DATA-
PIEZOMETERS IN EMPRESS GRAVEL

GROUNDWATER PIEZOMETER LEVEL MONITORING - ASH LAGOON AREA AND
INTERNATIONAL BOUNDARY AREA

SCHEDULE B - PIEZOMETERS IN EMPRESS GRAVEL

Responsible Agency: Saskatchewan Environment

Frequency of Measurement

Piezometer

Immediate Ash Lagoon Area

1	Q
6a	Q
6b	Q
C529	Q
C530	Q
C532	Q
C533	Q
C538	Q
8	Q
9	Q

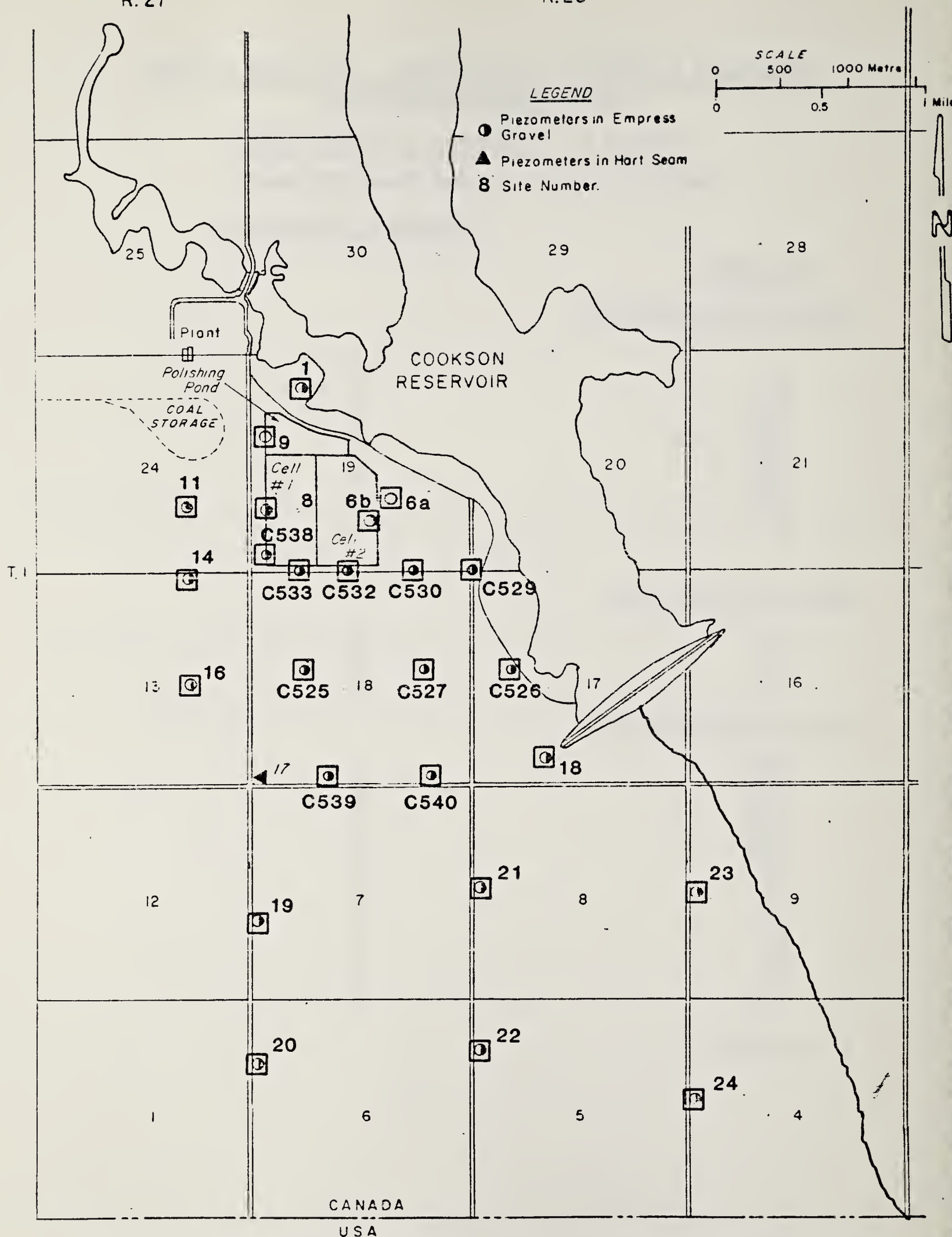
West of Ash Lagoon Area

11	Q
14	Q
16	Q

South of Ash Lagoon Area

C525	Q
C526	Q
C527	Q
C539	Q
C540	Q
18	Q
19	Q
20	Q
21	Q
22	Q
23	Q
24	Q

Q - quarterly



POPLAR RIVER POWER STATION ASH LAGOON MONITORING STUDY

PIEZOMETER INSTALLATION SITES SCHEDULE "B" PIEZOMETERS IN EMPRESS GRAVEL

Groundwater Piezometer Level Monitoring-Ash Lagoon Area
And International Boundary Area
Schedule B-Piezometers in Empress

Water Elevation (m) DOE Piezometer Ref. No.		1981				1982				1982									
		4th Quarter				1st Quarter				2nd Quarter				3rd Quarter				4th Quarter	
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			
1	C731		751.55	751.68	751.66			751.71			752.73			752.41					
6a	C763E		750.59	750.80	750.79			750.73			751.62			751.35					
6b	C765A	745.5		746.06	746.20	746.35	745.22	746.69		747.19	747.12	747.05	746.92	746.91	746.77	746.98			
C529	C529		749.84	750.02	750.01			750.44			750.84			750.59					
C530	C530				750.19			750.14			751.00			750.74					
C532	C532		750.10	750.28	750.25			750.22			751.05			750.81					
C533	C533		750.89	751.08	750.98			751.09			751.67			751.41					
C538	C538		751.38	751.52	751.46			753.79			751.94			751.79					
8	C730E	750.93		750.93	751.08	750.93	751.14	751.63		751.85	751.85	751.71	751.64	751.57	751.36	751.57			
9	C728E		751.23	751.40	751.52			751.40			752.28			751.99					
11	C743			751.74	751.71			752.07			752.25			752.09					
14	C740			751.74	751.72			751.89			751.97			752.04					
16	756				Dry			Dry			Dry			751.99					
C525	C525			750.69	750.71			750.82			750.94			751.38					
C526	C526			748.08	Damaged			748.04			748.65			748.47					
C527	C527			748.88	748.88			748.86			749.47			749.29					
C539	C539			750.94	750.95			751.04			751.25			751.36					
C540	C540			748.58	748.62			748.59			749.05			749.13					
18	C741		746.48	746.49	746.49			746.48			746.75			746.59					
19	C735		Dry	Dry				Dry			Dry			Dry					
20	C736		Plugged	Plugged				Plugged			Plugged			Dry					
21	C742		746.75	746.85				747.39			747.92			747.46					
22	C733		746.75	746.74				746.80			747.35			747.27					
23	C732		742.15	742.01				742.27			742.37			742.28					
24	C734		742.05	742.03				*			742.35			742.24					

* inaccessible

AMBIENT AIR QUALITY DATA

AMBIENT AIR QUALITY MONITORING

Responsible Agency: Saskatchewan Environment

<u>No. on Map</u>	<u>Location</u>	<u>Parameters</u>	<u>Reporting Frequency</u>
1	Coronach	Sulphur Dioxide	Continuous monitoring with hourly averages as summary statistics.
		Total suspended Particulates	24 hour samples on a 6 day cycle.

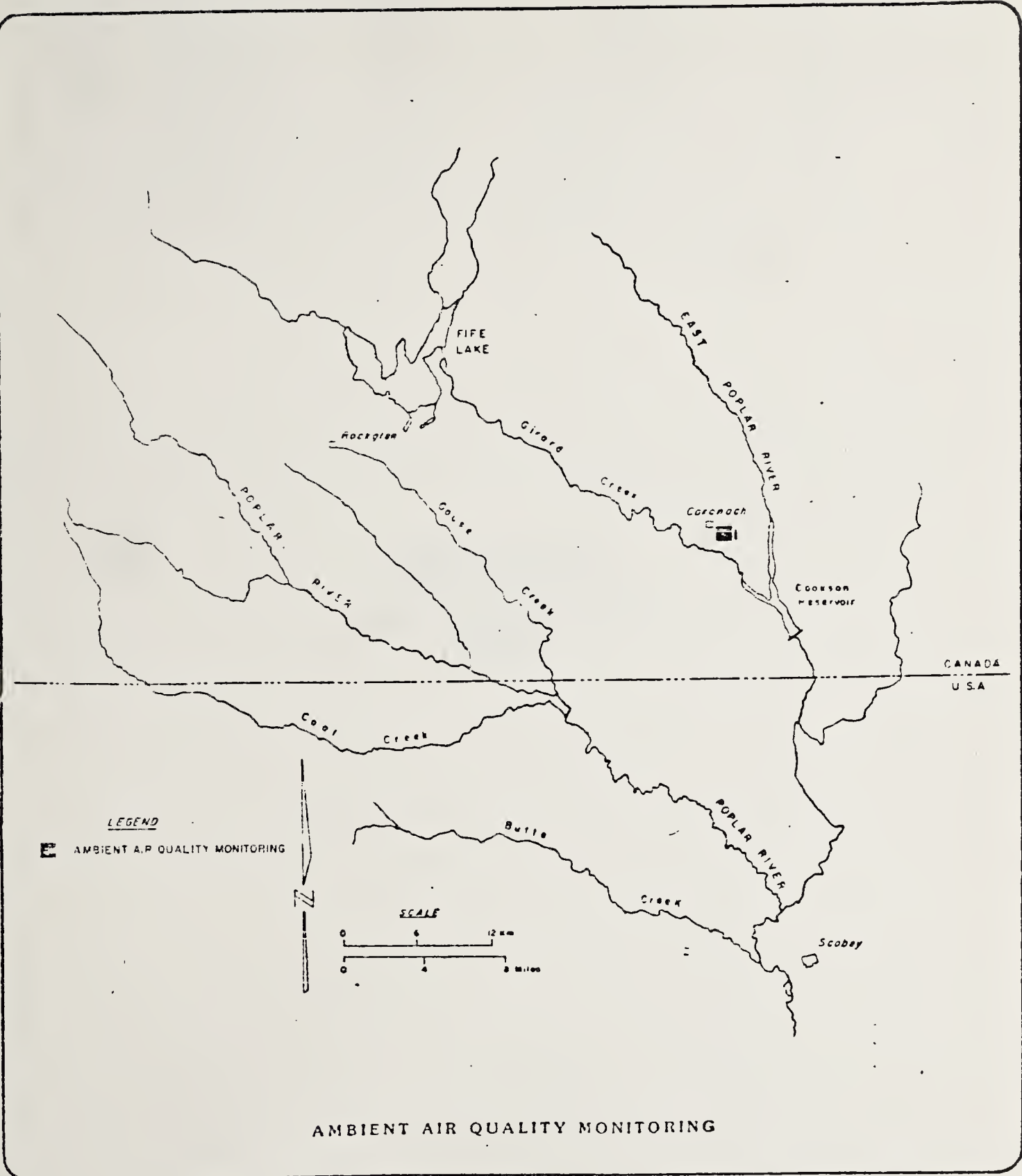
METHODS

Sulfur Dioxide

Saskatchewan Environment - Permit to
Operate R197R1, issued 15 January 1982,
-Colourimetric Titration

Total Suspended
Particulates

Saskatchewan Environment - Permit to
operate R197R1, issued 15 January 1982,
EPS A5-73-2 January 1973, High Volume
Method.



AMBIENT SO₂ DATA
WATER TREATMENT PLANT
CORONACH

MONTH OCTOBER, 1982

MONITOR LOCATION

WATER TREATMENT PLANT

CORONACH, SASKATCHEWAN

SOURCE SASK. POWER CORP.

POPLAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

POLLUTANT Sulphur Dioxide

UNITS pphm

COMMENTS

New chart installed October 1, 1982

at 1200 HRS.



DOWNTIME



SPAN



PLANT NOT OPERATING

COMPILED BY SASK. ENVIRONMENT

Saskatchewan Environment

Air Pollution Control Branch

DATA SUMMARY

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG	COMMENTS
1	X	X	X	X	X	X	X	X	X	X	X	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0.8	0.5	0	0	0	0	0.4	0	0	0	0	0	0	0	0.8	0.7	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

NOVEMBER, 1982

MONTH

1

OUR

1

—

10

DAY

DOWNTIME

SPAN

PLANT NOT OPERATING

COMPILED BY

Saskatchewan Environment

Air Pollution Control Branch

DATA SUMMARY

MONTH DECEMBER, 1982

MONITOR LOCATION

WATER TREATMENT PLANT

CORONACH, SASKATCHEWAN

SOURCE SASK. POWER CORP.

POPLAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

POLLUTANT Sulphur Dioxide

UNITS pphm

COMMENTS: Monitor down for the entire month of December. RAP responded to operators call of Dec. 14/82 on Dec. 15/82 Operator said H1V01 down no mention of SO₂. SO₂ monitor was repaired but recorder was brought to Regina for repairs. Jan. 6/82 DAP travelled to Coronach but had problems. A trip is scheduled Jan. 21/82 to repair SO₂ monitors.



DOWNTIME



SPAN



PLANT NOT OPERATING

COMPILED BY SASK. ENVIRONMENT

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

HOUR

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX AVG.	COMMENTS
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
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29																										
30																										
31																										

DAY

SOURCE EMISSION MONITORING DATA

SOURCE EMISSION MONITORING

Responsible Agency: Saskatchewan Environment

<u>No. on Map</u>	<u>Station Location</u>	<u>Parameters</u>	<u>Sampling Frequency</u>
1	At Poplar River Power Plant	Sulfur Dioxide Nitrogen Dioxide, Opacity.	Continuous reported as Hourly Averages

METHODS

Sulfur Dioxide

Saskatchewan Environment - Permit to
operate R197R1, 15 January 1982,
Ultraviolet Absorption

Nitrogen Dioxide

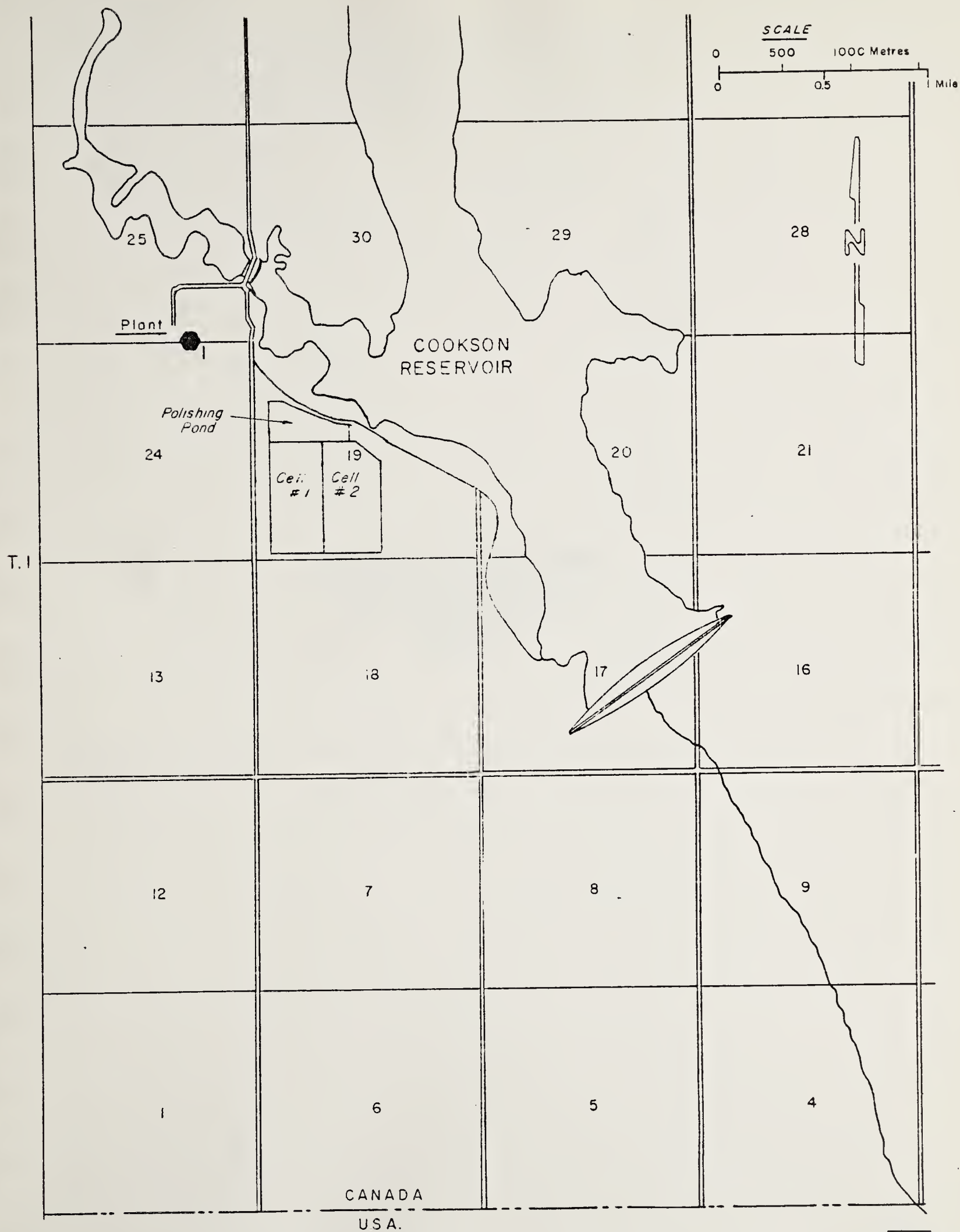
Saskatchewan Environment - Permit to
operate R197R1, 15 January 1982,
Chemiluminescence

Opacity

Saskatchewan Environment - Permit to
operate R197R1, 15 January 1982, Optical

R.27

R.26



SOURCE EMISSION MONITORING

SUSPENDED PARTICULATE DATA

WATER TREATMENT PLANT
CORONACH

AMBIENT SUSPENDED PARTICULATE DATACORONACH WATER TREATMENT PLANT

DATE 1982	CONCENTRATION ug/m ³
Oct. 2	17
Oct. 8	36
Oct. 14	68
Oct. 20	15
Oct. 26	88
Nov. 1	112
Nov. 7	74
Nov. 13	56
Nov. 19	*134
Nov. 25	36
Dec. 1	39
Dec. 7	-
Dec. 13	-
Dec. 19	-
Dec. 25	-
Dec. 31	-

* Exceeded Saskatchewan Environment's Provincial Standard

Saskatchewan's Provincial Standard 120 ug/m³

Geometric Mean 50 ug/m³

Arithmetic Mean 61 ug/m³

IN-STACK SO₂ DATA

MONITOR LOCATION	SASK. POWER CORP.

POPLAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

SASK. POWER CORP.





POPULAR RIVER GENERATING STATION

CORONACH - SASKATCHEWAN

SULPHUR DIOXIDE (In-Stack)

 $(\text{mg}/\text{m}^3, 3\% \text{ O}_2)$

COMMENTS	* Factor (x 10).
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
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54	54
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67	67
68	68
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70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

		DOWNTIME
		SPAN

COMPILED BY SASK. POWER CORP.

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

HOURLY

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG.	COMMENTS
1	289	289	286	281	280	283	282	271	278	274	281	270	268	273	278	285	280	282	280	280	202	262	275	272	289	279	
2	273	279	280	276	275	279	276	277	283	279	276	275	275	277	283	279	272	273	272	280	286	280	278	277	288	278	
3	279	283	281	268	267	270	271	266	271	269	267	262	259	265	269	263	261	269	274	275	281	283	291	287	291	258	
4	281	283	263	244	240	261	261	266	319	244	256	251	257	262	256	250	254	256	255	262	263	258	255	253	319	258	
5	253	260	252	235	226	226	232	237	237	327	249	259	263	189	148	201	246	259	260	257	263	266	259	256	327	244	
6	255	244	239	246	249	247	244	246	260	247	251	255	262	270	276	278	284	291	287	283	276	275	275	280	291	263	
7	279	276	268	262	260	250	246	238	256	262	248	266	269	272	280	283	285	286	284	280	281	279	282	282	286	270	
8	276	274	275	273	277	278	286	283	268	262	264	264	274	272	253	85	45								286		Insufficient data for average
9																											Insufficient data for average
10																											Insufficient data for average
11																			42	63	117	181	241	252	252		Insufficient data for average
12	252	255	257	263	256	250	263	266	293	264	264	267	274	279	278	287	302	334	317	303	300	285	286	290	334	279	
13	282	274	279	287	291	300	301	303	302	328	272	284	282	265	265	287	298	291	308	296	292	296	292	288	328	288	
14	290	277	274	270	266	268	275	263	280	268	256	279	283	284	273	268	257	256	252	249	243	242	256	262	290	267	
15	254	259	257	258	257	263	270	265	275	234	270	257	255	249	243	249	251	254	260	262	253	251	248	242	275	256	
16	244	246	239	231	239	237	242	238	243	243	241	241	240	243	244	239	241	242	237	240	242	238	240	206	246	239	
17	115	114	135	215	234	230	230	234	233	242	240	230	233	238	243	246	238	237	231	232	241	247	246	243	246	223	
18	249	246	251	255	250	242	242	236	257	259	253	256	272	262	266	270	264	262	260	260	257	251	259	263	263	256	
19	274	265	270	272	270	278	272	274	293	237	213	206	212	214	220	227	231	230	225	245	222	216	342	401	401	254	
20												262	245	222	225	227	234	232	232	234	230	230	211	208	262		Insufficient data for average
21	203	210	244	240	236	236	233	232	198	306	239	224	223	228	225	230	227	228	229	221	224	217	221	212	306	228	
22	208	206	203	208	201	195	196	198	201	205	226	209	212	211	206	208	218	229	235	233	231	234	262	285	285	217	
23	310	329	297	293	283	276	258	261	274	284	275	273	281	287	299	294	297	301	304	303	310	297	302	302	329	292	
24	291																								291		Insufficient data for average
25																											Insufficient data for average
26	194	198	201	205	209	208	206	212	215	218	217	220	220	219	211	214	218	213	206	256	267	300	291	285	300	225	
27	286	279	289	290	287	294	284	303	307	290	294	275	219	321	326	325	342	358	371	367	368	365	357	357	378	319	
28	360	362	340	339	350	345	336	336	292	243	286	292	304	291	296	304	303	308	307	311	324	306	306	316	362	315	
29	309	307	323	305	304	313	298	304	283	291	283	283	303	300	302	293	299	233	272	256	261	251			309	290	
30												268	272	274	279	275	277	277	272	262	263	264	264	257	279		Insufficient data for average
31	254	265	275	279	279							323	328	309	291	280	260	274	275	276	289	306	321	313	328		Insufficient data for average

MONTH DECEMBER, 1982

MONITOR LOCATION SASK. POWER CORP.
POPLAR RIVER GENERATING STATION
CORONACH, SASKATCHEWAN

SOURCE SASK. POWER CORP.
POPLAR RIVER GENERATING STATION
CORONACH, SASKATCHEWAN

POLLUTANT SULPHUR DIOXIDE (IN-STACK)
UNITS (mg/m³, 3% O₂) factor x 10

COMMENTS

Concentrations are 10% higher than shown

☒ DOWNTIME
☒ SPAN
☐ PLANT NOT OPERATING

COMPILED BY SASK. POWER CORP.

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

HOUR

COMMENTS

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG
1	346	329	340	351	333	348	358	358	353	<input checked="" type="checkbox"/>	322	322	342	334	334	334	334	334	334	334	334	253	274	271	358	329
2	277	286	296	280	282	282	272	276	283	287	246	259	287	313	301	252	309	309	311	307	303	310	310	299	311	289
3	299	307	307	300	297	289	306	307	305	298	289	292	291	301	297	265	294	285	288	283	292	278	269	275	307	292
4	275	279	289	288	278	270	265	268	272	276	275	283	300	297	296	295	295	283	278	281	286	267	267	274	296	261
5	278	281	293	293	292	293	292	291	290	294	299	310	282	260	255	254	269	266	271	270	290	291	302	322	322	265
6	320	333	338	350	357	350	326	298	295	302	314	258	301	296	309	309	315	310	316	324	295	288	286	288	357	311
7	277	293	293	288	291	291	287	285	293	280	294	309	310	305	306	302	305	291	300	283	314	286	282	288	314	274
8	286	281	275	282	284	283	288	298	306	297	297	294	299	245	272	279	260	262	262	272	263	261	174		299	263
9	17	35	12	37	35	108	254	267	282	273	291	295	293	295	212	266	271	267	269	272	281	275	277	281	295	214
10	283	285	275	280	277	276	275	287	293	304	330	321	313	315	317	321	319	318	326	333	321	329	332	337	337	307
11	339	338	325	328	332	337	341	335	328	330	335	344	336	333	339	343	333	333	335	335	335	324	334	322	344	334
12	320	330	319	328	320	316	319	322	328	340	330	331	327	311	323	324	331	325	326	328	333	327	321	332	340	326
13	328	318	329	328	327	316	316	314	312	322	325	326	335	298	317	319	322	335	314	313	321	321	320	330	335	321
14	336	339	345	344	335	340	347	338	345	330	325	342	353	333	336	344	351	347	351	342	347	351	356	356	356	343
15	338	351	356	349	348	344	344	345	344	344	344	355	341	265	324	340	330	333	342	332	336	330	313	314	356	336
16	313	297	296	294	296	296	294	289	282	327	345	349	446	388	327	333	334	339	342	331	337	342	356	368	446	327
17	370	366	358	364	381	373	362	362	347	342	350	360	358	229	267	279	273	279	287	286	288	292	295	286	373	323
18	290	283	290	282	274	279	282	276	270	274	283	281	287	288	289	289	281	288	281	276	275	278	273	281	290	282
19	285	277	276	255	237	258	271	269	268	274	272	279	267	273	275	274	270	260	264	264	267	266	267	258	285	268
20	269	270	271	260	274	267	261	263	301	355	385	246	261	261	267	271	275	271	264	267	255	217	118	44	274	258
21	68	32	23	146	217	240	244	248	233	232	260	262	260	259	254	260	257	260	257	262	259	259	263	264	264	221
22	259	264	268	255	257	267	269	272	252	252	266	263	269	269	265	265	271	272	271	267	271	270	266	266	272	265
23	267	268	268	268	263	262	260	249	255	253	230	232	241	247	243	241	241	241	241	241	240	230	239	240	268	249
24	244	243	241																						244	
25																										
26																										
27																										
28																										
29																										
30																										
31																										

Insufficient data for average

DAY

IN-STACK NO_x DATA

26

DAY

MONTH October, 1982

MONITOR LOCATION Sask. Power Corp.
Poplar River Generating Station
Coronach, Saskatchewan

SOURCE Sask. Power Corp.
Poplar River Generating Station
Coronach, Saskatchewan

POLLUTANT Nitrogen Oxides (In-Stack)

UNITS mg/m^3 , 3% O_2 expressed as NO_2

COMMENTS

DAY

DOWNTIME

SPAN



COMPILED BY Sask. Power Corp.

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG	COMMENTS
1	735	721	730	740	736	737	794	710	720	714	539	451	537	585	670	654	576	581	584	599	675	710	699	709	794	662	
2	714	707	706	699	712	697	706	704	713	737	737	750	748	709	716	736	701	710	722	713	700	670	684	683	750	711	
3	693	687	700	701	691	699	709	706	698	708	691	698	679	669	677	707	713	703	693	702	697	703	690	708	713	697	
4	726	724	722	743	759	725	719	711	498	605	662	683	677	730	559	683	685	667	674	653	687	686	685	678	759	684	
5	682	682	676	741	715	746	727	743	705	110	639	599	625	363	334	678	677	669	613	585	591	599	590	584	746	611	
6	596	596	611	508	612	614	606	612	524	509	588	584	585	590	600	630	630	630	640	625	630	615	605	640	640	599	
7	611	623	613	606	611	632	633	623	547	263	566	558	588	557	546	559	575	573	590	591	614	621	618	631	631	581	
8	641	630	648	622	647	659	657	620	580	547	629	627	623	628	641	125	86	X	X	X	X	X	X	X	657	insufficient data for average	
9																										insufficient data for average	
10																										insufficient data for average	
11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	43	52	139	226	235	227	235	X	
12	213	216	203	204	197	177	138	128	104	547	646	621	607	598	590	578	632	633	616	630	641	628	627	627	641	450	
13	636	638	635	637	638	628	620	608	563	350	596	593	629	769	721	683	677	675	609	508	542	563	591	603	769	613	
14	608	588	606	679	686	696	709	702	727	561	627	642	631	647	647	616	584	598	607	598	606	606	564	627	727	631	
15	609	612	599	629	602	596	599	636	571	509	690	647	652	675	684	649	660	632	644	626	608	613	601	616	684	623	
16	614	604	647	671	639	625	395	656	666	680	716	710	731	747	711	699	716	724	724	723	737	741	732	597	747	683	
17	178	188	590	802	820	826	832	838	825	817	827	846	875	850	841	806	810	707	837	817	773	754	782	818	875	756	
18	801	862	809	826	842	828	738	775	498	471	752	784	808	837	848	877	872	858	855	800	793	782	744	768	877	784	
19	784	807	803	801	757	734	750	717	634	394	560	575	595	623	641	597	532	613	581	591	551	446			804	640	
20	X	X	X	X	X	X	X	X	X	X	628	694	657	673	696	629	637	663	648	605	554	478	507	490	696	insufficient data for average	
21	328	326	590	600	597	557	586	621	415	137	618	702	703	630	625	642	648	644	643	675	660	683	686	656	703	583	
22	647	650	645	661	662	660	659	669	652	639	533	588	607	629	619	638	652	668	639	609	600	608	600	597	669	630	
23	605	641	647	663	644	669	687	666	639	624	666	656	656	636	648	637	635	624	635	633	649	617	616	634	687	643	
24	641	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	641	insufficient data for average	
25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	insufficient data for average	
26	493	503	509	559	560	451	461	558	517	506	535	507	512	509	515	511	497	593	506	642	753	753	650	617	753	546	
27	629	638	617	628	630	597	592	739	869	899	948	922	701	961	979	918	859	953	948	955	939	926	936	941	979	822	
28	929	920	921	903	874	902	808	817	684	570	663	669	739	746	662	671	656	696	712	708	720	736	892	835	929	763	
29	841	922	921	973	812	776	873	813	784	588	793	797	807	750	736	748	751	750	732	783	784	773	230		973	771	
30											418	947	931	924	915	931	891	846	855	870	821	747	746	777	947	insufficient data for average	
31	747	697	719	756	848							934	950	955	1038	1017	1027	1002	855	824	799	807	826	822	1027	insufficient data for average	

MONTH NOVEMBER, 1982

HOUR

MONITOR LOCATION SASK. POWER CORP.

POPLAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

SOURCE SASK. POWER CORP.

POPLAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

POLLUTANT NITROGEN OXIDES (IN-STACK)

UNITS m^3 , 3% O_2 expressed at NO_2 COMMENTS After Nov. 17, 1982 all data should be 10% higher due to O_2 analysis problem.

DOWNTIME

SPAN

COMPILED BY SASK. POWER CORP.

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG.	COMMENTS
1																											
2																											
3																											
4																											
5																											
6																											
7																											
8												666	908	888	824	750	849	834	811	785	777	769	751	752	908		Insufficient data for average
9	732	148												111	682	709	670	639	642	742	787	828	781	768	828		Insufficient data for average
10	785	864	896	914	890	891	896	820	724	745	823	782	764	670	736	781	787	785	775	832	842	865	916	931	821		
11	918	907	371																							918	Insufficient data for average
12																											
13																											
14												691	355	878	891	886	886	869	867	856	846	822	698	891			Insufficient data for average
15																											
16	735	891	841																								Insufficient data for average
17	814	876	857	882	874	976	1117	1084	823	878	989	1002	1003	968	973	896	896	848	751	857	849	834	871	860	1117	911	
18	973	1110	996	954	924	843	867	842	775	649	736	744	774	782	764	791	783	796	826	824	805	762	781	752	1110	823	
19	720	644	657	666	653	659	658	699	679	621	707	734	770	863	838	800	776	731	703	766	758	814	799	807	863	731	
20	877	1034																									Insufficient data for average
21												764	818	876	875	925	943	950	1007	1304	1945	1092	863	849	878	1945	Insufficient data for average
22	931	1012	1209	1446								407	815	869	841	794	715	744	749	758	781	789	798	736	801	1209	Insufficient data for average
23	763	791	771	787	769	846	812	870	714	759	740	704	725	758	810	828	789	744	749	731	725	751	754	766	846	769	
24	742	751	744	753	770	787	783	782	773	728	858	854	856	852	790	708	671	691	722	724	793	827	843	834	858	776	
25	847	814	782	783	811	792	787	804	678	756	821	819	863	920	879	877	847	879	898	866	858	876	572	908	908	821	
26	849	871	878	874	902	814	834	814	806	654	760	741	724	701	899	900	789	781	813	783	766	775	791	792	878	811	
27	795	806	797	836	816	780	837	820	800	786	780	775	762	702	703	708	720	765	789	762	736	760	771	799	837	766	
28	787	780	787	846	805	788	797	796	767	845	792	814	625	811	811	811	843	808	791	846	803	796	794	764	846	805	
29	801	786	756	756	811	850	830	844	758	727	877	882	886	901	936	905	851	893	898	821	943	944	940	821	944	854	
30	732	811	825	786	780	823	788	788	806	644	875	883	946	947	939	956	903	897	936	961	962	924	976	916	976	866	
31																											

MONITOR LOCATION
SASK. POWER CORP.
POPLAR RIVER GENERATING STATION
CORONACH, SASKATCHEWAN

SASK. POWER CORP.

POPLAR RIVER GENERATING STATION
CORONACH, SASKATCHEWAN

NOXITANT
NITROGEN OXIDES

UNITS

COMMENTS

..... Concentrations are 10% higher than shown

☒ DOWNTIME

SPAN

	PLANT NOT OPERATING
--	---------------------

COMPILED BY SASK. POWER CORP.

Saskatchewan Environme
Air Pollution Control Branch

DATA SUMMARY

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG	COMMENTS
1	963	971	926	938	960	955	925	972	895	348	738	743	749	785	785	785	785	785	785	785	735	601	655	681	963	810	
2	683	666	686	704	705	718	719	721	710	719	281	596	729	846	777	631	780	784	794	793	833	801	788	791	803	717	
3	807	784	808	827	869	877	813	763	755	793	811	803	802	791	806	656	793	760	793	796	756	774	757	759	877	790	
4	763	806	833	868	906	854	892	857	798	805	802	797	788	829	832	815	815	810	803	796	739	803	783	800	906	820	
5	786	763	767	810	825	808	797	801	795	776	818	857	912	899	906	904	863	853	838	802	813	815	834	857	912	829	
6	863	886	874	848	877	851	866	870	822	771	667	712	814	870	864	866	782	766	736	720	729	739	799	775	886	806	
7	738	756	756	789	803	821	791	804	703	744	836	814	828	798	782	795	822	753	611	568	518	729	751	753	836	752	
8	745	760	743	730	708	709	706	719	709	562	714	730	709	695	742	748	694	696	727	734	711	796	440	52	796	678	
9	40	82	63	76	76	234	723	651	694	686	651	680	718	711	490	681	626	637	678	623	651	737	753	732	753	527	
10	735	742	778	798	807	813	786	753	724	677	809	850	853	842	838	833	867	854	837	834	835	810	778	769	854	800	
11	755	788	796	785	788	762	757	790	784	788	490	787	806	835	806	811	802	781	797	793	794	766	759	789	835	788	
12	777	775	774	843	861	849	821	786	783	801	824	800	818	824	809	792	773	809	793	740	778	779	787	736	861	797	
13	786	789	738	731	760	746	743	723	715	786	798	785	747	733	700	690	741	673	707	709	716	714	711	706	798	737	
14	721	711	707	690	711	691	689	681	676	692	734	710	748	879	888	815	797	802	811	814	813	800	800	824	888	759	
15	796	723	762	773	770	789	771	781	793	816	750	841	810	615	744	725	737	771	768	732	727	794	779	762	841	764	
16	833	743	733	774	761	759	774	787	756	823	929	753	784	882	853	884	909	889	864	879	836	858	841	882	889	823	
17	900	870	901	859	853	869	820	842	908	938	847	895	908	649	626	612	629	630	621	628	623	599	613	621	938	761	
18	626	596	600	640	619	622	617	641	613	612	608	607	607	607	604	598	602	628	600	587	592	601	604	613	640	610	
19	608	635	642	842	815	805	842	823	764	754	761	781	785	763	750	739	748	773	736	732	724	727	754	785	842	754	
20	737	693	729	733	735	617	617	617	726	1061	1446	571	633	617	617	597	603	626	617	625	731	740	429	77	1446	674	
21	120	73	65	557	840	848	855	845	715	673	725	734	737	767	776	768	742	712	729	727	732	728	718	730	855	663	
22	748	707	686	761	720	713	712	700	641	623	684	708	702	636	611	626	638	632	613	601	621	661	654	639	748	667	
23	623	616	630	623	656	611	619	639	668	740	689	600	672	663	637	652	656	682	693	671	683	680	694	682	740	657	
24	669	669	696									699	682	687	675	698	676	693	684	672	696	686	681	706	706		Insufficient data for average
25	700	670	405																								Insufficient data for average
26																											Insufficient data for average
27	48																										Insufficient data for average
28																											Insufficient data for average
29																											Insufficient data for average
30																											Insufficient data for average
31																											Insufficient data for average

IN-STOCK OPACITY DATA

HOUR

MONTH OCTOBER, 1982

MONITOR LOCATION SASK. POWER CORP.

POPULAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

SOURCE SASK. POWER CORP.

POPULAR RIVER GENERATING STATION

CORONACH, SASKATCHEWAN

POLLUTANT OPACITY (In-Stack)

UNITS PERCENT (%)

COMMENTS

DAY



DOWNTIME

SPAN

COMPILED BY SASK. POWER CORP.

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG.	COMMENTS
1	38	38	38	39	40	40	46	38	41	42	36	40	37	37	39	39	37	38	36	37	38	39	39	39	46	39	
2	40	38	38	40	39	40	40	40	39	41	41	41	40	36	39	39	37	39	42	40	38	36	37	36	41	39	
3	39	37	39	37	37	39	39	39	38	38	40	40	38	37	39	41	39	37	38	38	38	37	37	38	41	38	
4	41	39	39	40	40	38	41	39	36	36	36	38	37	41	35	37	39	36	36	37	37	39	38	37	41	38	
5	38	36	36	43	38	40	37	45	39	29	39	31	32	67	92	88	57	59	54	44	40	38	36	35	88	46	
6	36	36	37	35	34	33	35	34	34	34	33	32	32	31	31	33	30	31	32	31	34	33	33	30	36	33	
7	36	37	37	36	36	38	39	40	37	40	37	32	33	30	31	31	33	31	33	32	35	35	32	36	40	35	Insufficient data for average
8	35	37	37	35	36	36	37	35	37	36	32	32	33	34	54	94	86								94		Insufficient data for average
9																											Insufficient data for average
10																											Insufficient data for average
11																											Insufficient data for average
12	65	58	55	34	40	45	42	40	39	36	39	27	26	27	30	27	27	30	28	31	31	27	26	27	65	37	
13	28	28	27	26	26	25	26	27	24	31	29	22	27	30	21	24	23	23	22	21	21	22	25	25	31	25	
14	25	25	24	26	22	21	21	22	26	25	26	27	25	26	25	24	25	26	26	23	23	24	22	27	27	24	
15	26	24	24	26	22	23	23	25	24	23	24	26	26	29	27	27	30	27	25	25	24	24	22	25	30	25	
16	24	23	27	25	26	24	22	24	25	28	27	26	28	27	26	27	26	27	24	26	25	26	24	74	74	26	
17	91	88	75	27	32	29	28	29	25	27	27	24	26	27	28	27	27	26	26	24	23	24	25	26	91	28	
18	26	32	24	27	29	30	27	31	25	23	28	29	30	27	26	28	30	27	28	28	29	32	29	30	32	28	
19	31	28	28	30	27	27	28	28	34	32	23	30	34	33	34	31	28	30	28	26	25	25	25	25	34	29	
20	26	26	27	25	27	26	25	23	26	31	30	32	29	31	28	28	29	30	29	29	28	30	31	29	31	28	
21	27	24	29	28	24	26	26	27	25	25	27	28	27	27	26	30	31	28	30	28	29	23	28	26	31	28	
22	29	27	25	28	25	25	25	27	27	29	24	21	22	22	21	24	19	20	18	17	17	17	17	19	29	23	
23	20	20	18	20	19	22	22	20	19	20	21	20	21	21	21	21	21	21	21	20	24	20	21	22	24	21	
24	21	20	22	20	23	23	19	20	21	20	21	22	21	22	23	24	23	23	23	26	26	27	29	29	29	23	
25	27	28	28	28	28	29	29	31	27	24	23	31	27	26	22		29	30	30	28	28	29	31	29	21	28	
26	26	26	27	32	32	31	31	33	29	34	33	30	34	35	35	31	25	20	22		21	23	24	24	35	30	
27	25	25	24	25	26	24	24	17				13	26	35	27	27	27	29	30	30	30	33	41	34	35	27	
28	30	30	32	31	28	34	31	27	25	26	28	26	29	25	27	26	27	30	28	26	26	27	28	28	34	28	
29	29	30	30	31	24	26	26	26	27	29	30	30	31	30	29	27	31	29	28	33	30	30	29	32	33	30	
30	28	24	25	23	25	27	26	30	28	27	27	28	30	32	32	31	29	29	32	31	29	26	30	29	32	26	
31	28	28	28	28	30	30	28	25	24	24	25	25	26	29	33	31	33	32	28	26	27	28	26	27	33	26	


MONTH NOVEMBER, 1982

MONITOR LOCATION SASK. POWER CORP.
POPLAR RIVER GENERATING STATION
CORONACH, SASKATCHEWAN

SOURCE SASK. POWER CORP.
POPLAR RIVER GENERATING STATION
CORONACH, SASKATCHEWAN

POLLUTANT OPACITY (IN-STACK)
UNITS PERCENT %

COMMENTS

 DOWNTIME
SPAN

COMPILED BY SASK. POWER CORP.

Saskatchewan Environment
Air Pollution Control Branch

DATA SUMMARY

HOUR

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MAX	AVG.	COMMENTS
1	26	26	27	23	21	23	24	26	28	28	28	26	29	26	26	26	29	30	29	30	24	24	26	23	30	26	
2	26	28	29	24	21	20	21	23	23	22	25	27	25	31	24	27	23	22	23	23	24	24	26	23	29	26	
3	25	24	22	24	26	27	26	23	26	26	26	23	19	20	21	19	18	16	20	21	21	22	25	27	22		
4	23	22	22	22	22	23	21	22	22	26	25	24	26	25	26	23	22	23	23	24	26	26	24	28	28	24	
5	25	30	31	30	26	30	32	27	24	26	26	28	28	30	31	27	27	30	30	32	32	30	31	41	41	29	
6	38	35	33	33	34	35	35	36	39	37	37	35	35	32	31	31	33	36	32	33	31	36	35	32	39	34	
7	29	28	29	29	29	29	28	28	28	34	31	29	33	26	25	27	26	29	25	25	25	27	27	33	33	28	
8	26	31	29	29	29	28	27	27	28	30	29	26	26	26	28	34	31	31	24	31	31	28	25	24	31	28	
9	24	25	23	21	22	22	22	22	27	21	28	30	29	28	25	25	24	25	24	25	24	24	21	23	29	24	
10	23	24	26	26	24	25	28	33	23	26	30	28	32	32	26	25	26	25	25	27	26	26	29	28	32	27	
11	26	26	27	28	23	23	30	27	25	24	26	28	29	26	29	27	24	23	24	21	21	21	21	21	30	25	
12	21	22	21	24	23	23	22	22	23	24	23	26	25	34	29	32	34	30	32	27	24	25	26	22	34	26	
13	23	22	22	24	22	22	22	24	25	24	23	23	24	24	25	23	25	24	23	23	23	22	20	19	25	23	
14	13	21	21	21	19	19	19	21	25	27	30	29	27	26	29	28	29	27	27	28	27	24	26	26	30	25	
15	29	25	25	25	26	25	28	26	30	31	27	28	27	27	27	29	28	28	25	25	26	28	27	28	31	27	
16	29	28	31	32	27	26	27	29	27	27	29	13		28	29	29	28	31	31	31	31	29	31	29	32	28	
17	26	31	29	30	29	30	28	26	26	29	29	31	31	30	30	28	26	26	26	26	26	25	28	31	28		
18	30	39	30	31	27	27	28	27	26	27	29	29	29	29	28	29	29	30	32	30	30	28	29	28	39	29	
19	28	30	32	29	28	28	28	30	30	39	30	30	32	29	33	28	34	31	33	32	29	33	33	32	39	31	
20	30	29	32	31	31	28	28	31	27	28	30	29	30	30	35	35	33	32	32	33	33	32	32	33	35	31	
21	34	36	36	34	31	31	33	31	30	29	29	28	28	27	30	29	28	29	27	28	27	28	27	28	36	30	
22	31	28	28	27	27	25	27	29	26	27	28	32	31	31	32	27	28	29	28	33	32	33	29	32	33	29	
23	29	33	32	31	27	32	27	28	26	31	28	26	28	28	33	29	34	31	31	31	30	33	33	33	33	30	
24	33	34	32	33	33	34	34	32	35	32	30	31	32	31	34	24	29	32	30	30	32	31	32	31	35	32	
25	32	30	29	29	31	33	30	28	26	35	30	28	31	33	33	35	32	32	32	32	31	33		24	35	31	
26	29	29	30	29	32	34	28	26	26	25	27	28	27	28	31	29	31	31	28	27	27	28	31	30	31	29	
27	31	33	31	35	33	32	35	35	33	33	35	38	35	31	31	33	32	34	27	27	32	31	32	32	38	33	
28	31	31	32	35	33	32	33	33	30	35	33	33	32	32	32	33	35	33	33	36	33	33	33	32	36	33	
29	34	35	33	34	37	38	37	35	32	34	34	35	34	37	33	29	29	35	34	37	39	37	35	34	38	35	
30	31	36	37	35	35	36	35	34	34	32	33	28	30	28	26	29	29	29	32	32	29	28	28	32	37	32	
31																											

DAY

		HOUR																								COMMENTS		
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		MAX	AVG.
88	1	34	35	33	35	33	33	33	33	32	27	29	29	25	28	28	28	28	28	28	28	23	27	31	28	35	31	
	2	28	28	29	28	26	27	27	24	23	30	22	23	24	26	22	22	23	23	25	24	24	25	23	20	30	25	
	3	20	21	20	19	20	20	19	21	21	23	24	23	22	22	23	26	25	20	20	21	21	20	20	20	26	21	
	4	22	23	21	24	25	23	22	21	24	25	25	24	25	27	25	23	24	25	23	21	22	21	22	27	27	24	
	5	21	21	22	24	23	23	23	25	24	25	26	25	25	25	24	24	26	27	26	24	25	27	25	27	25		
	6	24	23	24	23	26	26	27	25	25	25	28	29	27	26	25	32	26	26	26	23	22	32	26	27	32	26	
	7	24	25	25	26	26	27	27	28	26	31	37	37	39	32	29	26	32	30	23	22	14	30	30	31	39	28	
	8	31	32	30	29	28	28	28	28	30	30	31	32	33	35	32	34	28	29	31	32	23	30	57	96	96	34	
	9	96	100	97	100	101	97	89	89	81	72	68	61	64	66	56	56	56	54	55	54	51	56	54	51	101	72	
	10	53	53	53	51	50	49	50	48	42	45	44	48	48	47	45	44	45	50	44	42	42	40	38	37	53	46	
	11	38	39	40	41	40	39	38	41	40	38	38	38	41	38	41	43	43	39	41	40	33	46	45	48	48	41	
	12	39	39	38	44	45	39	42	46	48	44	45	39	40	42	41	39	40	42	40	39	42	50	49	41	50	42	
	13	42	41	38	36	39	39	40	38	38	41	40	39	37	39	40	40	42	37	39	36	34	35	34	34	42	38	
	14	34	35	34	34	34	33	34	32	32	32	34	32	34	35	29	37	31	33	33	36	36	37	38	39	39	34	
	15	37	33	37	47	34	35	34	33	33	35	30	36	34	32	34	34	33	35	36	32	34	38	35	35	47	35	
	16	37	31	39	43	40	44	44	44	42	32	34	32	38	36	41	39	37	35	36	37	34	38	36	35	44	36	
	17	35	34	37	35	34	37	32	32	35	34	33	36	37	35	30	30	33	31	30	32	31	28	29	31	37	33	
	18	32	30	29	32	31	33	33	32	41	37	35	34	30	30	30	30	31	34	32	30	23	29	30	31	41	32	
	19	32	40	41	42	42	36	35	37	38	37	38	38	41	38	37	33	33	35	31	32	33	29	35	38	42	36	
	20	33	32	35	34	36	33	32	29	29	29	39	29	31	30	29	29	30	32	32	32	42	56	92	92	92	36	
	21	90	95	99	80	75	88	79	83	78	73	72	72	72	76	73	62	48	47	51	50	45	43	44	43	99	68	
	22	44	41	43	46	39	40	39	39	38	37	38	37	36	33	33	32	33	33	32	32	31	37	34	32	46	37	
	23	32	31	32	31	35	33	34	36	59	90	91	43	38	35	32	32	31	33	32	31	31	33	32	31	91	39	
	24	31	31	32	30	32	31	35	31	31	33	32	36	30	31	31	33	32	33	32	31	33	35	38	37	38	33	
	25	32	33	58																							Insufficient data for average	
	26																										Insufficient data for average	
	27	71																									Plant not operating	
	28																										Plant not operating	
	29																										Plant not operating	
	30																										Plant not operating	
	31																										Plant not operating	

DAY

DOWNTIME
SPAN
PLANT NOT OPERATING
COMPILED BY SASK. POWER CORP.

Saskatchewan Environment
Air Pollution Control Branch
DATA SUMMARY

